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food processing

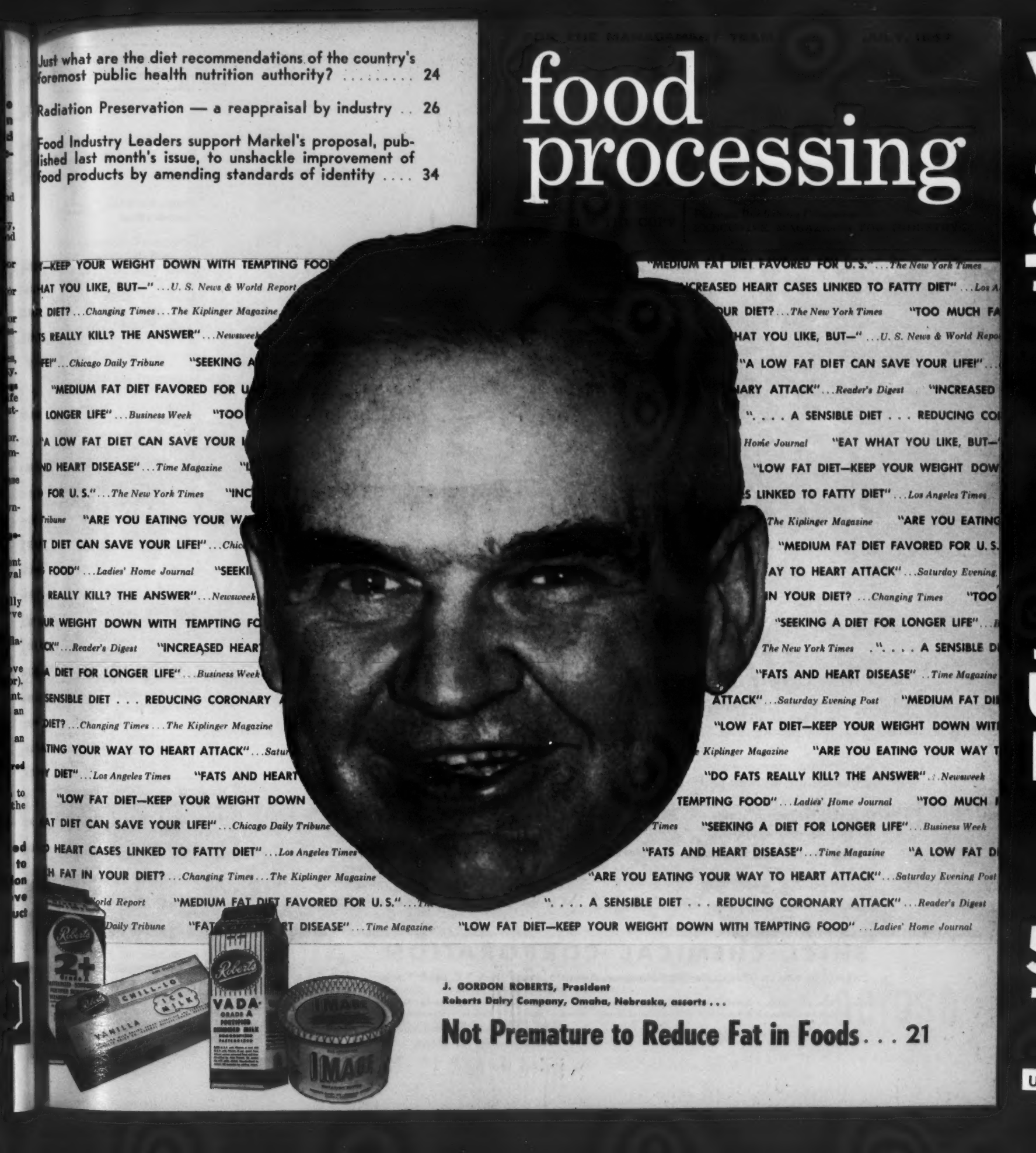
"MEDIUM FAT DIET FAVORED FOR U. S." ...The New York Times
"INCREASED HEART CASES LINKED TO FATTY DIET" ...Los Angeles Times
"EAT WHAT YOU LIKE, BUT—" ...U. S. News & World Report
"A LOW FAT DIET CAN SAVE YOUR LIFE!" ...Chicago Daily Tribune
"SEEKING A DIET FOR LONGER LIFE" ...Business Week
"FATS AND HEART DISEASE" ...Time Magazine
"LOW FAT DIET—KEEP YOUR WEIGHT DOWN WITH TEMPTING FOOD" ...Ladies' Home Journal
"ARE YOU EATING YOUR WAY TO HEART ATTACK" ...Saturday Evening Post
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IMAGE

J. GORDON ROBERTS, President
Roberts Dairy Company, Omaha, Nebraska, asserts . . .

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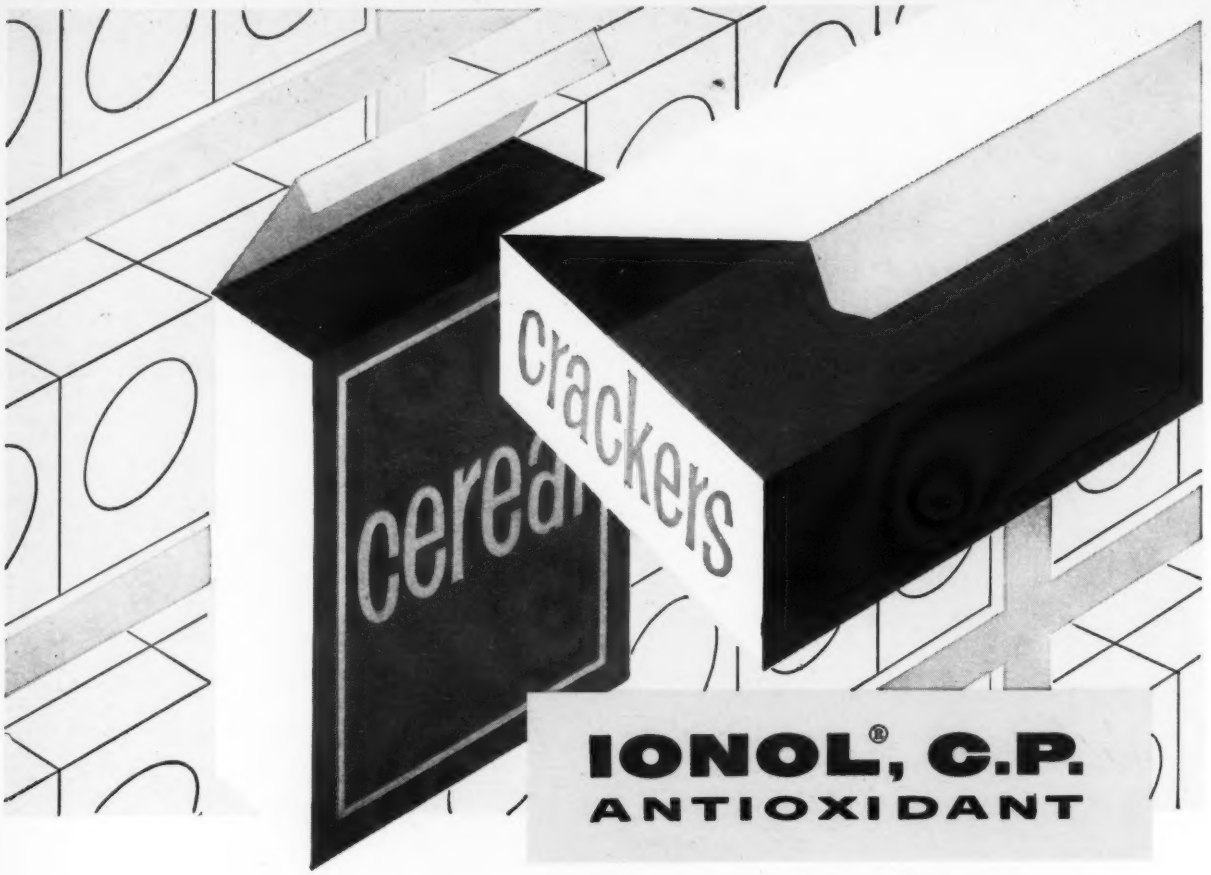

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Ionol, C.P. is an effective food-grade antioxidant. Impregnate boxboard and paper with it, and you protect aroma and flavor by preventing oxygen attack on fats right where it starts—at the surface of cartons and wrappers.

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SHELL

When inquiring check 4802 opposite last page

that's interesting

California doubles olive production

Production of olives has doubled in past 20 years, while number of trees has increased only 5%. Last year, California produced about 70,000 tons.

More peanuts in '57

'57 peanut price props have been clipped to $221.40 a ton, compared to last year's $227.04 support. Current 82% parity is 4% less than in '56. This year's peanut harvest is forecast as up 24%. National peanut acreage allotment has been increased to 1,611,441. (Flavor News Letter-Food Materials Corp., Chicago 32, Ill.)

Mayonnaise centennial

In 1756 the Duke of Richelieu's forces captured the island of Minorca from Spain. Headquarters were established at the town of Mahon. The Duke's cook, while pondering what to do about lack of fuel to make a hot sauce, spilled egg yolk into olive oil. Mixing it cold, he found he had a tasty condiment. Returning to Paris, the Duke took the recipe with him and introduced it to the court of Louis XV.

Pineapple market

Puerto Rican pineapple interests are eyeing U. S. Market with idea of getting some of the $115,000,000 export business now enjoyed by Hawaii. Puerto Rico's present pineapple acreage is only 4,200. Government aid is expected to boost this to 20,000 by 1962.

Lactose enhances flavors.

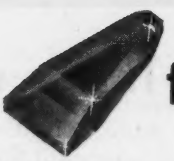
Acts as an excellent aroma catcher.

Serves as a pigment

absorbent.

Provides uniform browning and caramelization.

And, gives you unique health properties.

Just think what Lactose can do  for your product!

Works wonders on everything...from roquefort cheeses to barbecue mixes. The new pricing pattern on milk sugar makes this amazing product a practical ingredient for hundreds of foods.

Lactose is a low sweetening, free flowing, crystalline sugar. It tenderizes, holds freshness, aids in dispersing and drying, and is not fermented by brewer's yeast.

Western Condensing Company manufactures Edible, U.S.P. and Fermentation milk sugar in granulations tailor made for your specific use.

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Remember, our coast-to-coast manufacturing and distribution facilities assure dependable supply and efficient service.

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• Appleton, Wisconsin

A WORLD-WIDE SUPPLIER OF HIGH-QUALITY MILK DERIVATIVES

For more information on product at right, specify 4803 see information request blank opposite last page.

food processing

(FOOD PROCESSING PREVIEW)

For the Management Team
Published in Chicago
Food Capital of the World

VOL. 18 NO. 7 JULY 1957

OVER 35,000 CIRCULATION IN THE FOOD PROCESSING INDUSTRIES

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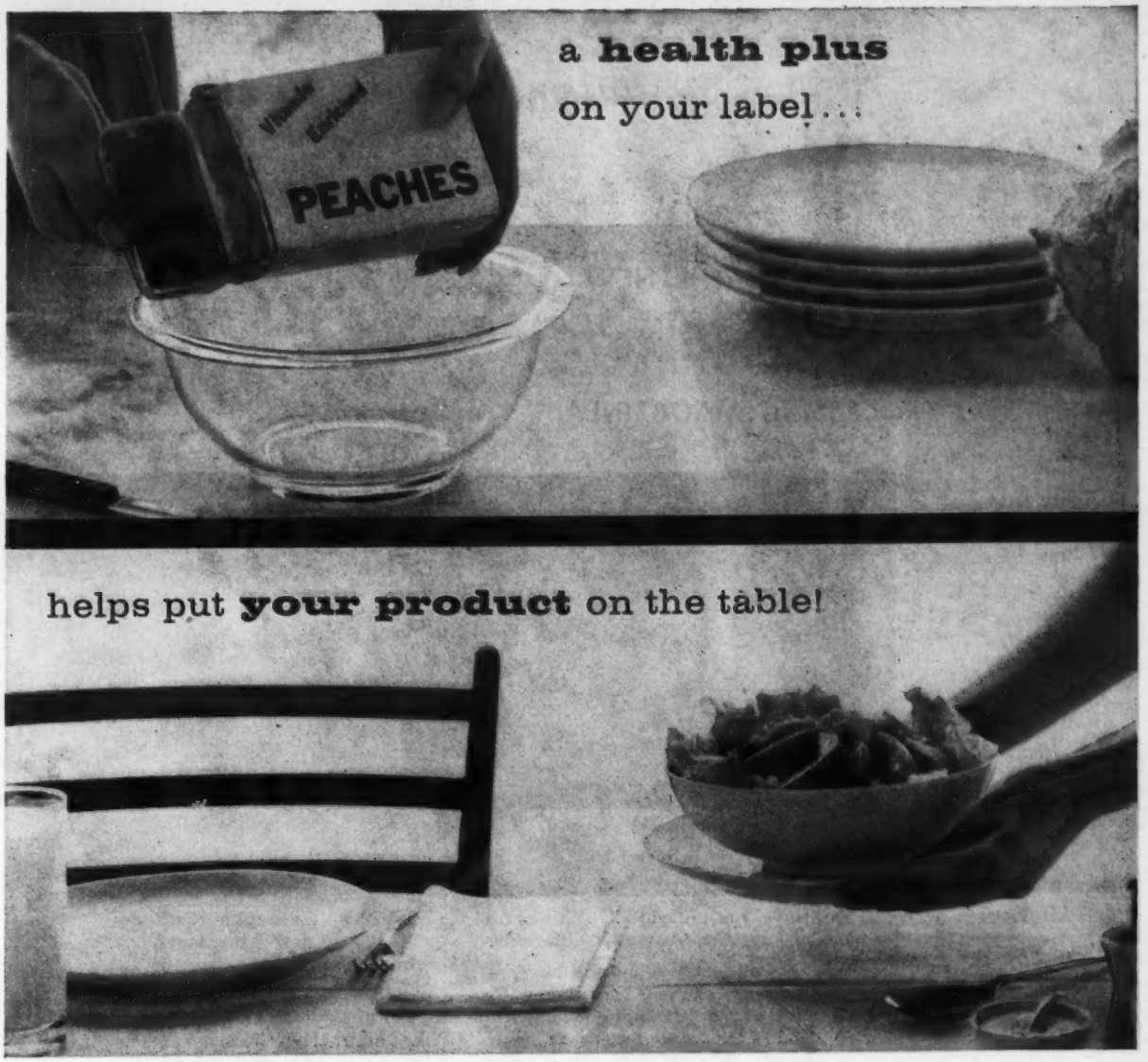

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● Today's health-conscious consumers will find extra sales appeal in your frozen packs when you include the words "VITAMIN ENRICHED" on your label. This competitive advantage costs you surprisingly little with Pfizer Ascorbic Acid (Vitamin C).

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Pfizer

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statement from Publisher....

Russell L. Putman
Publisher of FOOD PROCESSING

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"Executive Size"

OF *FOOD PROCESSING* MAGAZINE

Have you noticed? . . . this issue of FOOD PROCESSING is "different".

Lay this copy alongside an earlier issue of FOOD PROCESSING . . . April, for example. Compare. Hold the new issue in your hands. Slip it into your brief case. It "fits" . . . invites easy reading . . . of busiest executives. That's how it came to be called

"Executive Size"

. . . for, as one of our editors exclaimed when we were in the planning stages, "This really *is* an executives' magazine".

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Nineteen years ago Putman Publishing Company created the original design for business magazines, known as "King Size" . . . bringing theretofore unknown visibility and greater effectiveness in editorial presentation (yes, for advertising also.) Scores of other magazines adopted this format, and use it today.

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We think you'll find FOOD PROCESSING easier to read, more interesting. But what do you think? We are always interested in the reactions of you readers. We shall welcome any comments you care to make.

Russell L. Putman

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Publisher, FOOD PROCESSING
President, Putman Publishing Company

All Putman magazines now appear in this new "Executive Size" . . . FOOD BUSINESS, CHEMICAL PROCESSING, INDUSTRY POWER as well as FOOD PROCESSING.

food processing **highlights**

July 1957 volume 18 number 7

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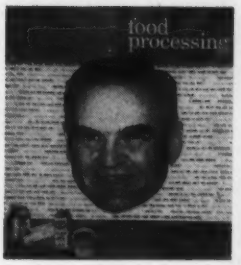
THIS MONTH'S COVER

The face on this month's cover belongs to J. Gordon Roberts, a dairy owner who dared break with his industry's tradition of fat-rich foods. Last January, his company launched a vigorous, 20-city "educational" advertising campaign promoting a newly perfected low-fat, high-nutrition dairy spread and other low-fat products. What Roberts has to say about products, publicity, and the obligations of a great industry will be found beginning on page 21.



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Life on a hot shelf means short shelf life if your product is not protected from rancidity.

You can eliminate lost profits, the cost and customer dissatisfaction of rancidity returns with Sústane BHA antioxidant. In easy-to-use, easy-to-store tablet form, Sústane BHA gives your product these definite competitive advantages:

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Sústane BHA is oil and fat soluble, giving complete solubility for maximum effectiveness. Sústane BHA is odorless, colorless, tasteless as ordinarily employed and is not affected by slight alkalinity so that it can safely and conveniently be used with no formula alteration.

Won't you write for a sample of Sústane BHA for testing in your own laboratories? Or, we'll be happy to recommend the Sústane formulation that will give your products the greatest all-around protection.

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food regulations

How FDA Plans To Establish Safe Radiation Tolerances

Proof of safety required of processors who use radioactive materials, states FDA's Larrick

Safety of the nation's food supply in the atomic age is receiving mounting attention in Washington. Commissioner George P. Larrick of the Food & Drug Administration revealed that studies to arrive at safe radiation tolerances have been started.

Processors are to be intimately involved in nuclear energy development (see page 26. As nuclear reactors are built, for instance, processing plants that may be affected by waste products from power plants will be surveyed by FDA. Purposes, among others: (1) to be sure that radioactivty of incoming raw materials such as the water supply is within limits of safety, and (2) to assure that radioactivity is not concentrated by operations, such as boiling, ion-exchange, or absoprtion.

Radioactive materials, Mr. Larrick says, will be considered in the same category as food additives. Pending legislation, proposed by FDA, would require pre-testing and proof of safety by the processor who employs radioactive materials just as in the case of chemical additives for foods.

Delaney's new bill refers to 'hot' materials

A recent additive bill (HR 7798) introduced by Rep. John Delaney (D. N.Y.) provides that the term chemical additive shall include "any radioactive material". The new bill proposed by Mr. Delaney is a revised version of legislation (HR 4014) which he introduced earlier this year.

The program to establish safe radiation tolerances involves both animal feeding and chemical analysis. For this testing, several hundred samples of a variety of canned foods, packed prior to 1945, have been assembled by FDA to gauge radioactivity in modern-day foods, compared with those of a pre-atomic age.

Effect on wheat of fall-out from atomic bomb tests is being surveyed on the Navada proving grounds. FDA survey work is being carried out in cooperation with the AEC.

Study of radiation safety is inextricably linked with work on irradiation of foods for preservation to be undertaken at the new irradiation facility near Stockton, Calif. (fully described in June issue of FOOD PROCESSING, page 27). AEC Commissioner, Dr. Willard F. Libby says: "The reactor is expected to irradiate a wide variety of foodstuffs, which in turn would be consumed by animals and in some cases by human volunteers to make sure that there are no adverse effects of irradiation on the edibility of the food."

FDA Comissioner Larrick, an alternate member of an interdepartmental government committee on food preservation by nuclear energy, told a representative of FOOD PROCESSING: "The research in this

area involves some basic and difficult scientific questions."

We must be sure "that the food will not suffer changes in taste, that the texture will be maintained, and appearance will not be too seriously altered, and above everything else, that the atomic radiation does not add any fissionable products that are harmful to the food or rearrange molecular structure of the food so as to cause harm."

May hold up hearings on additive bills

Odds are now against serious consideration during this session of Congress of food additive legislation. It appeared at press time that hearings may be delayed.

"We have been tied up with natural gas legislation," FOOD PROCESSING was told by Rep. John Bell Williams, (D., Miss.), chairman of the Science subcommittee of the House Interstate & Foreign Commerce committee, "and no thought has been given to hearings on additive bills."

FDA continues vegetable color certification

The issue of how a "coal-tar color" shall be defined is expected to go to hearing, following FDA rejection of a proposal filed by Hoffman-LaRoche Inc., Nutley, N.J. The company petitioned for exemption from certification of such vegetable color equivalents as carotene, widely used in oleomargarine.

FDA disagreed, making only a minor amendment in its earlier proposals.

Objections were due to be filed within 30 days of the order's publication in the Federal Register on June 7. The order will become effective within 90 days of publication, barring provisions that may be stayed by the filing of exceptions. Hoffman-La Roche has already announced request for public hearings on the order.

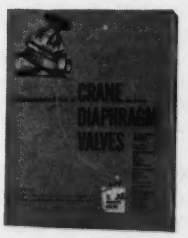
World's Largest Sea Water Salt Plant Proves Crane Valve Quality

Three times longer valve life on corrosive weak brine

Before Leslie Salt Co. changed to Crane diaphragm valves here in its Newark, Calif., plant, lubricated plug cocks were causing constant maintenance. The highly corrosive condensate and weak brine solution being handled pitted the plugs, started leakage, and forced replacement of the cocks every 2 years.

To date, the Crane neoprene-lined diaphragm valves have already given 3 times longer service than the cocks. In these valves, the diaphragm isolates the working parts from line fluid, and the neoprene lining protects the disc and body. Result: after 6 years of cost-free usage, the Crane valves are still seating tightly with easy operation.

Valve performance like this can only come from correct design, better materials, precision assembly, and thorough testing—features you cannot detect from outside appearance. Why gamble with your valves and fittings? Specify Crane and be sure of top-quality flow control.



Get Crane Folder AD-1942 on packless diaphragm valves. See your Crane Representative for a copy, or write Crane Co., address below.

CRANE VALVES & FITTINGS

PIPE • PLUMBING • KITCHENS • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

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Brief but Important

The question of grade-labeling of canned fruits and vegetables has been revised. The issue won't come to a head during this session of Congress, but a study has been promised by the Consumer Study subcommittee of the House Agriculture committee. The subcommittee, now established as a permanent group, is headed by Chairman Victor L. Anfuso (D., N.Y.). Mr. Anfuso has raised the question of whether processing and distribution practices and costs are hurting consumers, but says his committee has no intention "of embarrassing any segment of the food . . . industry."

✦ ✦ ✦

A compromise solution is expected, eventually, to the question of what government agency shall have future jurisdiction over meat industry trade practices. USDA now has enforcement authority, but support has been building up behind legislation that would transfer jurisdiction to the Federal Trade Commission. Compromise would: (1) keep in the USDA jurisdiction over meat packer practices, and (2) transfer to FTC jurisdiction over non-packer firms such as food chains.

✦ ✦ ✦

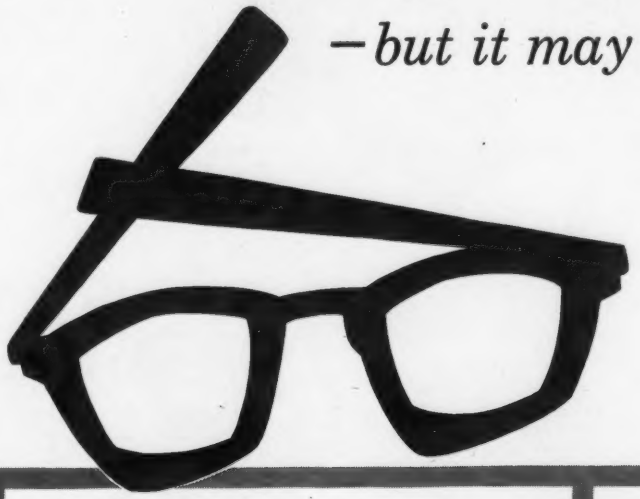
Release to growers of four new varieties of sesame has been announced by the USDA. Sesame is a crop-producing seed for use in bakery goods and confections (see page 52) and as a source of edible oil. Developed by plant scientists of the department and the Texas Experiment Station, the new varieties are Margo, Blanco, Dulce, and Delco.

✦ ✦ ✦

Recent survey by the USDA reveals that production of frozen prepared foods in 1955 was 60% greater than in the preceding year. Details are included in a report which may be obtained free from the USDA, Office of Information, Washington 25, D.C. Ask for Research Report No. 170, "Production of Frozen Prepared Foods, 1954-55."

Nothing new in this

—but it may pay you to read it!



It may pay you because some of these long-established advantages of Dicalite filtration — all proved by you and food processing men you know — have perhaps slipped into the back of your mind. A fresh look at them could be of present value, so take two minutes to read on.

Brilliant Clarity The clarity of filtrate obtained with Dicalite filteraids is unsurpassed by any other method. And, since Dicalite filteraids are dependably uniform, lot after lot, you can *depend* on the results of Dicalite filtration.

Sharp Filtration Dicalite filteraids remove *all* unwanted particulates, even down in the bacterial range. All decolorizing clays, activated carbon and the nickel catalyst used in hydrogeneration — every trace is removed.

Complete Stability Dicalite filteraids are both chemically and physically stable . . . they cannot react with the finished product, nor will they add or alter flavor. With the correct grade of Dicalite, there is no color reversion when filtering hydrogenated oils.

Fast Flowrates A Dicalite filtercake is only 10% solid — 90% voids; giving both high throughput and longer filtration cycles before the filters must be cleaned. Saves filter cloths and screens, too.

If you have not completely investigated the advantages of Dicalite in your processing, write for Dicalite Bulletin B-13, which discusses the practical applications of Dicalite filteraids in processing.

DICALITE DEPARTMENT • Great Lakes Carbon Corporation, 612 S. Flower St., Los Angeles 17

These advantages have all been proved by food processors themselves, both in their own laboratory tests and in actual production. They are the reasons why Dicalite filteraids are widely used by leading producers of sugar, syrup, vinegar, wine, beer, cider, soft drinks, jellies, preserves, edible oils and fats, and other food products.

Dependable GLC GREAT LAKES **Dicalite**® DIATOMACEOUS MATERIALS

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New lower-cost "dripless" can perfect for edible oils...

Canco's **ACCU-POR** container

At last — a container that's just right for edible oils and many other liquid food products . . . a can that offers the user new convenience and neatness . . . a package that gives your product an important sales "extra" at lowest cost!

The Accu-Por container pours freely, accurately, yet won't drip a drop when righted. It is easy to handle, can't break, is light in weight. Because your label is lithographed all around the container, it has great eye-appeal! And remember: Canco offers brilliant metallic finishes . . . precision, full-color lithography.

Accu-Por containers are available in 16-oz. and 32-oz. sizes, priced as much as 25% below comparable cans.

Ask the Canco packaging expert today for further information about this remarkable all-metal container!

COME TO CANCO FIRST!

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New York • Chicago • San Francisco

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FDA STANDARDS

List of foods for which standards have been established is available from Food and Drug Administration, Washington 25, D. C.

Orange juice: National Association of Frozen Food Packers has petitioned for standards for heat-processed orange juice, and also for industrial orange juice (or orange juice for processing). For the latter product, the proposals include provision for use of chemical preservatives. Comment on the petition has been invited by FDA which, in turn, has proposed standards for frozen concentrated orange juice in both sweetened and unsweetened form. Comment and objections on both the Association and government proposals were expected by officials, and final orders are probably some time off, with hearings a possibility in the meantime.

Niacin & riboflavin: Label statement regulations have been announced establishing adult Minimum Daily Requirement for miacin at 10 milligrams: 5 mg for children less than six years old, and 7.5 mg for a child more than six. Riboflavin MDR has been set at 1.2 mg for adults, 0.6 mg for infants, and 0.9 mg for a child. Effective date of the order on labeling is July 1, 1958, or just about a year off. Persons adversely affected, meantime, had until July 1, 1957, to submit written objections.

Canned fruit: Comment has been invited on the petition by the National Canners Association requesting changes in standards to allow use of artificial sweeteners in canned apricots, cherries, figs, fruit cocktail, peaches, and pears. Officials contend that canned fruits containing artificial sweeteners are, in effect, a different product, and should be so designated. The Association disagrees. A final order may be some time away.

Color certifications: Objections have been filed to the government's order to eliminate use on food of FD&C Yellows No. 1, 2, 3, and 4.

(Continued on next page)

Announcing...

MERCATE "20"

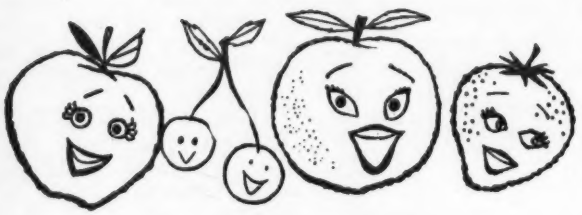
(SODIUM ISOASCORBATE, MERCK)

MERCATE "5"

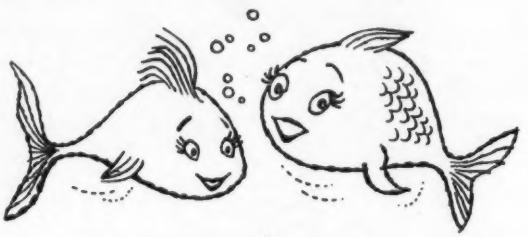
(ISOASCORBIC ACID, MERCK)

Lower Cost Antioxidants

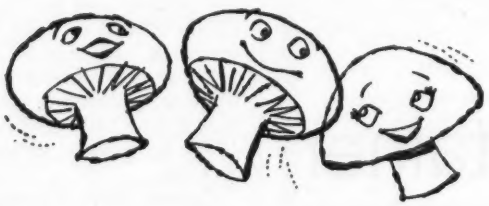
to Preserve Natural Color and Flavor



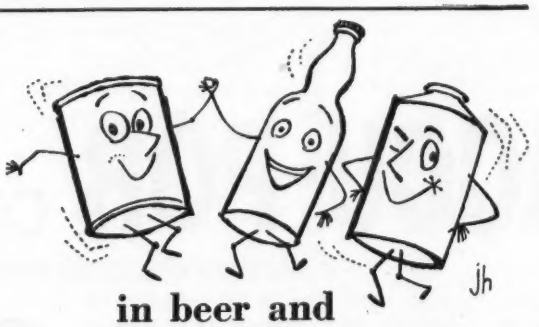
in frozen fruit



in frozen fish



in processed mushrooms



in beer and carbonated beverages

MERCATE "20" and MERCATE "5"—the new stereo isomers of sodium ascorbate and ascorbic acid—offer you the full antioxidant effectiveness of the older ascorbates *at a substantial savings in cost.* Use either product to increase shelf life and boost consumer acceptance for a variety of nonfat foods and beverages. You can count on MERCATE "20" or MERCATE "5" to minimize the development of undesirable color, flavor and odor, and to reduce container corrosion.

SEND FOR FREE SAMPLES.
Address Dept. FP-7
MERCK & CO., INC.
Rahway, New Jersey

MERCK

© Merck & Co., Inc.

When inquiring check 4810 opposite last page

food regulations

(*Continued from preceding page*)

The comment was being studied, at press time, to determine whether hearings should be held. The order, meantime, was to take effect early in August of this year.

Penicillin in dairy cattle: An order has been issued limiting the amount of this antibiotic which may be used in treatment of dairy cattle for mastitis. Maximum established is 100,000 units per dose. Some dosages have been a million units or more, officials report, and traces of the chemical have turned up in the nation's milk supply. The order was to take effect in mid-June, unless stayed in whole or part by filing of objections and request for a public hearing.

USDA STANDARDS

Checklist of new or poposed grade standards issued by USDA follows. Except where noted, complete tests can be secured from USDA, Fruit and Vegetable Branch, Processed Division, Washington 25, D.C.

Canned onions: Time was extended until August 1 for submission of views on proposals for grade standards.

Cranberries: Standards for processing have been proposed at the request of processors in order, officials say, "to facilitate processing on the basis of uniform quality . . ." One grade, US No. 1, is provided. To meet requirements for this grade, the product must be clean, mature, not soft or decayed, at least fairly well colored, and not less than 9/32 inch in diameter. Comments were due on July 5.

Walnuts: Proposed revision of in-shell walnuts would supersede existing standards for "unshelled English walnuts". Change in title is suggested by the fact that the present designation is a misnomer, carried over from the time when the product came to this country in English ships. Revision includes certain minor changes and additions in size classifications. No changes are proposed in quality requirements of grades No. 1, 2, or 3.

Canned Okra: Revised grade

standards now in effect. Largest portion of the product today is prepared from partially fermented okra. Previous standard was not applicable to the bulk of pack, because it covered only that product prepared from fresh, immature pods. The revisions include both types of the canned product. Clearness of liquor has been elminated as a scoring factor, and recommended drained weights have been established. Grades provided by the revisions are Grade A or Fancy, C or standard, and Substandard.

Kadota Figs: Proposed revision of standards for the canned product covers styles of whole, whole and split, and split, and provides for dietetic" packs. Recommended drained weights are changed slightly, but syrup measurements remain unchanged. Definitions for styles and syrup measurements used in the revision are those established by FDA for all canned figs. Grade-standard revision is limited to the Kadota variety.

Persian Limes: Revised standards became effective on June 15. Principal changes include clarification of wording pertaining to color classifications and rewording of the definitions for damage and serious damage by blanching. The new wording permits whitish to yellowish green areas caused by shading to cover 25% and 50%, respectively, of the surface of No. 1 and No. 2 grades.

Shrimp: Proposed standards for the frozen raw breaded product apply to shrimp which have been headed, peeled, deveined, and coated with a batter prior to freezing. Grades, designated as A, B, and Substandard, are determined primarily by appearance, freedom from defects, and character. Size designations are based on the number of breaded shrimp per pound. Labeling requirements are not included, but the product when sold in interstate comerce is required to conform to labeling regulations of FDA. Comment on the proposals, developed by the Interior Department's Fish & Wildlife Service, should reach USDA by July 18.

PACKAGING FLEXIBILITY
PAYS OFF AT FEDERAL

A Lynch Robo-Lift elevating conveyor and a Lynch Robo-Wrap automatic unit packager combine to reach new production highs, lower packaging costs for the Federal Tool Corp., Chicago. Requiring but one operator, the integrated team produces an average of 45 packages a minute ...has the flexibility needed for quick changeover from one size to another. Manually fed, Robo-Lift takes the product "up 'n' over" for fast Robo-Wrap package forming, filling and sealing—all in one continuous action. The hard-working, Robo-Lift—Robo-Wrap team operates three shifts a day, six days a week... has logged just nine hours downtime in three months! Learn how Robo-Lift, Robo-Wrap packaging can serve you . . . bringing lower maintenance and operating costs, increased output. Used individually, Robo-Wrap and Robo-Lift can be integrated with your existing equipment. Write for full details. Address Department D.

LYNCH ROBO
CORPORATION
A Division of
LYNCH CORPORATION
Anderson, Indiana

FEDERAL TOOL ROBO-WRAPS PLASTIC ITEMS OF VARIOUS SIZES, SHAPES

When inquiring check 4811 opposite last page

Tap your own hot-water line for high-power cleaning . . . with the new Oakite SANISEPTOR

Oakite SANISEPTOR is made of 14-gauge seamless cold rolled steel. Mixing chamber and injector parts of brass and bronze. Holds 15 lbs. of detergent. Three hose nozzle tips furnished to handle different requirements.

A hot-water faucet and an Oakite SANISEPTOR — that's all you need now for mechanized sanitation on a plant-wide basis.

No pump, motor or steam supply. Use the pressure in your hot-water line to power the Oakite SANISEPTOR. Just fill the unit with concentrated Oakite detergent, hook into your nearest hot-water faucet . . . and that's all! A twist of the valve sends a jet-stream of hot detergent solution wherever you aim it. Twist another valve and you get instant rinsing action. Use it for speedy sanitation of tanks, vats, equipment, floors, walls, hard-to-reach places — everywhere in the plant. Weighs only 25 lbs. Eliminates ladder, bucket and brush, dangerous climbing.

Ask your local Oakite Technical Service Representative to demonstrate the new Oakite SANISEPTOR, or write for free illustrated folder. Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

OAKITE

Export Division Cable Address: Oakite

Technical Service Representatives in Principal Cities of U. S. and Canada

When inquiring check 4812 opposite last page

letters from readers

Food Additive Legislation

Washington, D.C. — I have now had a chance to read your May issue, particularly the various references to the proposed chemical additive legislation, including the article prepared by Howard Milleville and Jay Richter.
These gentlemen are to be congratulated on presenting the subject so completely and also recording the various points of view involved.

GEORGE P. LARRICK
Commissioner of Food and Drugs

Washington, D.C. — I have carefully read your fine treatment of the proposed food additive legislation. I like your handling of it, too, although there are points expressed in several of the interviews with which I don't agree.
Have you noted Rep. Delaney's new bill, HR 7798 (May 28)? It is similar to his HR 4014 except it:
1. Makes specific mention of radioactivity.
2. Makes specific mention of carcinogenic substances.
3. Includes chemical additives fed to livestock which may indirectly get into food.

FRANK L. GUNDERSON
Technical Consultant

● Rep. Delaney's new bill is noted in Food Regulations section of this issue . . . Those readers who missed the round-up of food additive legislation are referred to pages 46, 47, 48, and 53 of the May issue. Views of legislators, FDA officials, and industry leaders are covered. —EDITOR

Future of Canned Soft Drinks

San Jose, Calif. — Your article on canned soft drinks was very interesting. We, on the Pacific Coast, are not too enthusiastic and believe the canned soft drink business will take a great deal of promotion before it makes any great progress.
Bottlers, as a whole, are not going to be interested in cans until they become more economical to produce. The particular problem in our case, is that we are franchised to operate in a very small territory. The volume of sales that may be expected would be very small.
Present sales volume that we could expect on canned soft drinks certainly would not justify the heavy expenditure required for canning machinery. If manufacturers do develop and offer a cheap canning machinery line, our interest would no doubt change.

R. J. STEACY
Coca-Cola Bottling
Company of San Jose

Dallas, Tex. — The Nehi Corp. has probably made more progress in the canned carbonated beverage field than anyone else, and it would appear that your editorial people had extracted accurate and relatively complete information from their John White as the basis for your article.

WESBY R. PARKER
Executive Vice President
Dr. Pepper Company

Atlanta, Ga. — At the request of our Senior vice president, Mr. Forio, I have had occasion to do some research on canned soft drinks.
Our views on cans have not changed in the past several months. We only can for the military, at its request, and have no plans for cans in the immediate future. However, should the subject get real hot at any time in either the near or distant future, we shall let you know.

FRANK GARRET
The Coca-Cola Company

New Rochelle, N.Y. — One of the surest ways to rouse the ire of a soft drink bottler is to call his product "pop".

S. P. MUDD
Seven Up Bottling Co.

● We religiously avoided the use of this "irreverent" word in the article. Then inadvertently used it in the Table of Contents. —EDITOR

● For another commentary on canned soft drinks see page 16. —EDITOR

For more information on product at right, specify 4813 . . . see information request blank opposite last page.

it sets a man to thinking!

"Flavor Improvement, New Products, Product Development—what I would have given for that kind of help when I started this business.

"Come to think of it an outside evaluation of flavor might be a smart move for us. Then if our product has become a little old fashioned, we will find it out before decreasing sales tell us.

"Guess we should check with them on Product Development, Eye-Appeal, New Product Suggestions, too. We've known the Stange name for years so—like they suggest—perhaps we'd...better check with Stange and be sure."

The **WM. J. STANGE CO.,** *Manufacturers of Seasonings and Food Colors, extends to the Food Industry a three-fold service involving Flavor and Color Improvement—Product Development—New Product Suggestions. Any or all three services are available through a Stange representative or by letter.*

better check with

STANGE

and be sure

A MICROGROUND SPICE CREAM OF SPICE SOLUBLE SEASONING GROUND SPICE
NDGA ANTIOXIDANT PEACOCK BRAND CERTIFIED FOOD COLOR

WM. J. STANGE CO.

Chicago 12, Ill. Paterson 4, N. J. Oakland 21, Calif.

CANADA: Stange-Pemberton, Ltd.—New Toronto, Ontario
MEXICO: Stange-Pesa, S. A.—Mexico City

Litho in U.S.A.

according to Vernors Ginger Ale, Inc.

future of canned beverages is encouraging

R. David
Sales Manager, Vernors Ginger Ale, Inc.

Detroit, Mich.—I thought your article on canned soft drinks in the May issue very interesting and informative.

I thoroughly agree that the market's growth has been slow because as you state, it had gone through a "boom and bust cycle" within the first three years mainly because of many inferior products and just as many inferior containers.

Most technical problems overcome

You are also correct in your assertion that the container manufacturers have eliminated a good many of the failures which plagued them, but there are still one or two failures in which they need to develop their package further. There are still far too many "leakers" in even the present cans on the market, although I believe that they have eliminated many of the faults that caused poor shelf-life or a bad product from the reaction of the liquid on the can liner.

I thoroughly agree that now that we have gotten some of the bugs out of the picture, canned soft drinks should continue to have a rapid and expanding consumer market, not as you say "even though it deviates from the traditional package" but mainly because it does just that. We waited until a fairly satisfactory can had been developed before we agreed to get into the market. Last year was our first real experience and our second year in the canned business. Our results have been very satisfactory and every week opens new possibilities for this product.

Promoted as a premium product

We started out on the premise that since Vernor's had always been a quality popular drink and always at a good price, the best way to introduce cans was on the same basis. Whereas every other can in this market did and does still today sell for 6 for 59c, our carton is priced at 6 for 79c.

We did this for several reasons:

1. We wanted to re-emphasize in the public's mind the fact that it is a quality package.
2. Although the public's bad experience with cans had been on the 6 for 59c basis, it seemed to us that a considerably higher price would convey the idea that it is a much higher grade package and warrant that price.
3. We did not want to get into the canned business on a cut-throat basis but only if we could make a good or better profit than we did on the bottled item.

We feel that our success has borne out all of this thinking and we have established our product as of today on a good solid foundation.

Our product is exceptionally good in cans because of a slight reduction of gas volume which the cans permitted and which gave us a milder drink.

Avoid competing with bottles

We have been very careful to promote the cans on a plane which does not detract from our bottled package. This is a little hard to do because all of the good things you can say about a can are direct reflections on the bottled product. In other words, the can's good features are the bottle's bad features. So we have stayed away from the "no-deposit", "no-return" ideas, "will not break, "is not a hazard to children" and all those arguments which would be very helpful in promoting canned sales. We have tried to confine ourselves to statements such as: "packs readily in your car and refrigerator", "chills quickly", "gives a bigger drink", "is itself a delicious product", and "very convenient for — any outdoor occasion".

The last argument is quite effective in this area of Michigan where everybody spends a good deal of time in the open in summer — beaches, cottages, boating, etc. It is also quite effective even in the wintertime because of the long hunting season in Michigan.

We have found the can works out particularly well with some of the large food caterers, who service manufacturing plants in this area, as it allows them to get a justifiably higher price for the beverage because it is a 12-oz drink. They like it because it gives them a good margin of profit, chills very readily, packs in ice conveniently, and does not leave them with an empty container pick-up problem.

New markets

We also feel it has quite a potential in parks and resorts through vending machines and we, at the moment, are experimenting with this idea. This has the same good features as the plant distribution idea.

There is quite a reception

for soft drinks in cans through vending machines in many industrial plants, particularly those who make or deal with steel. These people are very loyal to their product and will buy anything that comes packed in a can.

Eventually, cans will be the economy package

We also feel that as the bottled product keeps raising in price, the can is going to become a more desireable and a more economical item. Our can at 15 to 20c from the caterer or a vending machine is at a price level that will not permit further increases. Whereas the bottles have taken an increase each year for the past 4 to 5 years and will probably continue to do so for another round or so, therefore the two items are gradually becoming more competitive from the price angle alone. Once they reach a plateau where they are approximately the same, I think we will see a terrific spurt in canned sales and the bottle will no longer be the economy package.

We feel that this will eventually come and are preparing ourselves by slowly and soundly building a foundation under the canned business.

"It's only until we expand our office facilities, Eric."

Link-Belt S-815 flat-top chain improves food container handling

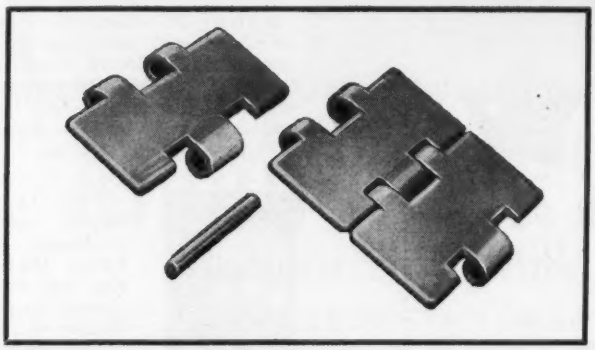
Offers conveying flexibility—simplifies assembly, maintenance

Link-Belt S-815 flat-top chain presents a safe, smooth conveyor path for handling food and beverage bottles, cans and similar containers through washing, filling, capping and other operations. Designed to simplify conveying in bottling plants, canneries and dairies, S-815 chain is readily adaptable to new or existing machines.

One-piece links are formed from steel strips and connected by steel pins. Top edges of links are beveled to permit free movement of containers across the surface. Pins can be quickly removed for easy maintenance and chain adjustment.

Available in five widths—in carbon or stainless steel. And its simple design eliminates dirt-catching pockets and crevices—an important feature where sanitation is essential.

LOW-COST S-815 flat-top chain conveys cans of beer from filling and capping machine. Smooth, unbroken carrying surface of chain reduces danger of tipping.



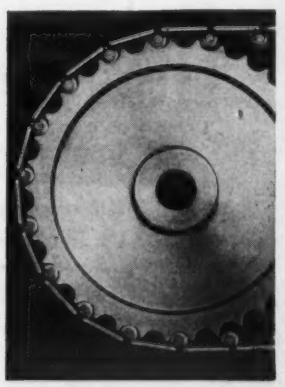
One-piece S-815 link serves as integral carrying platform

One-piece links, with beveled edges, dovetail with adjacent links to form a smooth, continuous carrying surface. Elimination of the straight-line lateral gap between links removes the danger of tipping or jamming stalled containers, permits chain to slide freely under them. Chain can be detached at any convenient pitch by merely removing the connecting pin. Ask for Folder 2344.

Unique design of S-815 sprockets doubles life

Specially designed cut-tooth sprockets for Link-Belt S-815 flat-top chain provides twice the necessary number of teeth, doubling wheel service life. This design refinement insures close control of tooth profile and dimensional specifications, resulting in proper chain engagement . . . minimum wear . . . quiet, smooth operation.

In operation, links contact every other tooth. Odd number of teeth in sprocket automatically distributes wear. However, similar service can be obtained with even number of teeth by periodically indexing the sprocket one tooth.



HEADQUARTERS for chains, sprockets and other Link-Belt conveying and mechanical power transmission products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,285

When inquiring check 4814 opposite last page

TO MEET THE DEMAND FOR

high protein

INVESTIGATE

Kesco VITAL WHEAT Gluten

80 PER CENT PROTEIN

A KEESTAR PRODUCT

THE EMPHASIS TODAY is on more protein. Are you as conscious of this trend as consumers?

KESCO VITAL WHEAT GLUTEN is being used as a protein supplement by many food processors, including the baking, cereal, macaroni and health food industries for improving established products and developing new products.

KESCO VITAL WHEAT GLUTEN is guaranteed 80 per cent protein. Due to this high concentration, a little goes a long way. Investigate how **KESCO VITAL WHEAT GLUTEN** can help you.

***SEND FOR SAMPLES,** analysis and further information.*

THE KEEVER STARCH COMPANY

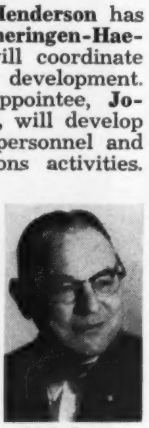
COLUMBUS 15, OHIO

Processors of Grain Products for Industry Since 1898

When inquiring check 4815 opposite last page

plants companies personalities

Dr. Wm. N. Henderson has joined **van Ameringen-Haebler, Inc.** He will coordinate research and development. Another new appointee, **Joseph I. Brennan,** will develop and coordinate personnel and industrial relations activities.



H. L. Seaton

H. Lyle Seaton has recently received appointment as agriculturist for the Pacific Coast Division of **Continental Can Company's** Metal Operations Group.

Administrative promotions at **McCormick & Co.,** Baltimore, Md., include: **W. Ernest Issel,** vice president and treasurer; **John L. Buckley, Jr.,** controller; **Edward T. Ellis,** director.

John F. Connelly was elected board chairman and president of **Crown Cork & Seal Co., Inc. Russell Gowans** was elected vice president and appointed president in charge of the Western Division.

J. J. Babb

Jervis J. Babb, board chairman of **Lever Bros. Co.,** has been elected to the board of directors of **American Molasses Co.,** New York City.

H. J. Barum

H. J. Barum Jr. has assumed the post of executive vice president of **Shirriff-Horsey Corp., Ltd.,** Plant City, Fla., in charge of Florida, Canada, and Jamaica operations.

Stein, Hall & Co., Inc., New York City, has named **Robert Becker** manager of the Industrial Foods Dept.

Glenn H. Freeman is new sales manager of **Adolph's Industrial Food Products Co.,** Los Angeles, Calif.

J. L. Murray has been appointed comptroller of **Red Star Yeast and Products Co.,** Milwaukee, Wis.

N. W. Kempf

The American Assn. of Candy Technologists' Stroud Jordan Award was presented to Norman W. Kempf of Walter Baker Div., General Foods.

Union Carbide Corp. is new name for **Union Carbide and Carbon Corp. The Carbide and Carbon Chemicals Co.** division, has officially been changed to **Union Carbide Chemicals Co.**

Expansions-Mergers

National headquarters of **Continental Baking Co.** have been transferred from New York City's Rockefeller Plaza to a $1 million general office-research laboratory building in Rye, N.Y. . . **First Spice Mixing Co., Inc.** of New York City has opened a new western plant at 185 Arkansas St. in San Francisco. . .

Connecticut Pie Baking Co., Inc. has acquired **Wandy Pie Co.,** also of Hartford, Conn., and **McCarthy Pie Co.** of Springfield, Mass. . .

Fradelis Frozen Food Corp. has added 12,500 sq ft of plant and warehousing space to the Los Angeles plant.

conventions and exhibits

July 22-24. National Macaroni Manufacturers Assn., annual convention, Grand Hotel, Mackinac Island, Mich.

August 26-29. American Society for Horticultural Science, annual meeting, Stanford University, Palo Alto, Calif.

August 26-28. American Phytopathological Society, annual meeting, Stanford University, Palo Alto, Calif.

August 28-30. International Symposium on Gas Chromatography, Michigan State University, East Lansing.

Sept. 8-11. National Frozen Food Merchandising Exposition and Convention, Hotels Sherman & Morrison, Chicago.

Sept. 9-13. Instrument Society of America, annual conference and exhibit, Public Auditorium, Cleveland.

Sept. 15-18. Produce Packaging Assn., annual conference and exposition, Shoreham Hotel, Washington, D.C.

Oct. 1-3. Third Joint Military-Industry Symposium on Packaging and Material Handling, Fort Lee, Va.

Oct. 3-4. Quartermaster Assn., 10th annual convention, Fairmont Hotel, San Francisco, Calif.

Oct. 9-11. Fourth Annual Symposium of High Vacuum Technology, Hotel Somerset, Boston, Mass.

Oct. 14-16. Second International Sanitation and Maintenance Show and Conference, Navy Pier, Chicago.

Oct. 20-25. Milk Industry Foundation, Dairy Industries Supply Assn., International Assn. of Ice Cream Mfrs., dairy convention week, San Francisco.

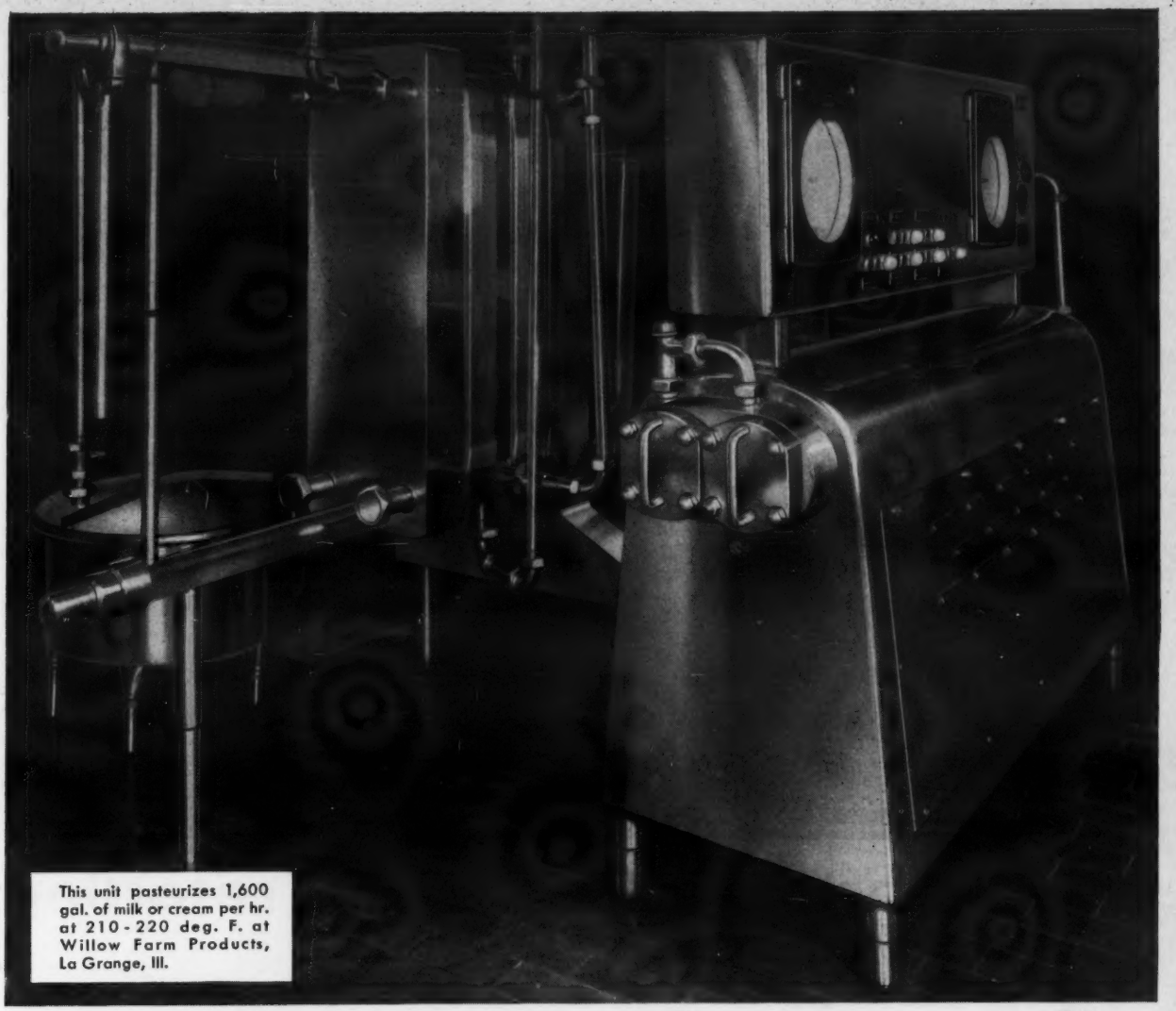
Oct. 21-25. National Safety Council, Chicago.

Oct. 28-30. Packaging Institute, Annual Forum, Hotel Statler, New York City.

Oct. 28-31. National Industrial Packaging and Material Handling Exposition, Convention Hall, Atlantic City, N.J.

Nov. 11-14. International Soft Drink Industry Exposition, American Bottlers of Carbonated Beverages, annual convention, National Guard Armory, Washington, D.C.

Nov. 18-21. Refrigeration and Air-conditioning Industry Exposition, International Amphitheater, Chicago.

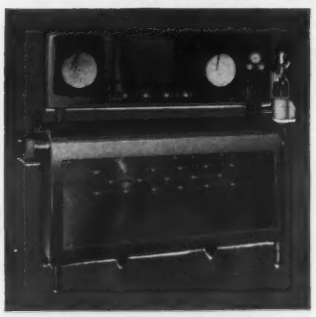


This unit pasteurizes 1,600 gal. of milk or cream per hr. at 210 - 220 deg. F. at Willow Farm Products, La Grange, Ill.

Another FIRST for Roswell

Pasteurizing Milk at 210-275 deg. F.

FASTER PROCESSING • FINER FLAVOR • MAXIMAL STERILITY



The Hi-Heet Roswell Unit pasteurizer fits the needs of all large or small dairies. Plants with plate type equipment can adapt it to the Roswell process as a regenerative section.

Now milk, cream, chocolate milk, is being "Roswellized" quicker, at higher heat—following the other Roswell FIRST of 4 years ago in pasteurizing ice cream mix. Roswell "Hi-Heet" pasteurizers were the first ultra high temperature, short time, continuous high capacity processors.

Get Surprising Capacity You run milk through at approximately 18,000 lb/hr at 210-275 deg. F. Capacities of 30,000 lb/hr are achieved with a 4 tube unit.

Have a More Salable, More Profitable Product Beyond amazing capacity, users are delighted with the sweeter, fresher, cleaner flavor of Roswellized milk. Bacteria is reduced almost to sterility, assuring longer shelf life, reduced returns, and greater safety, especially in long-distance shipping. You get a more uniform product that's more nutritious, easier to digest. For information on this notable advance in dairy practice write directly or contact your nearest Roswell Distributor.

hi-heet Roswell pasteurizer fits needs of all small or large dairies.

CHICAGO STAINLESS EQUIPMENT CORPORATION
5001 Elston Avenue
Chicago 30, Illinois

When inquiring check 4816 opposite last page

A SPECIAL STARCH FROM NATIONAL...

resists breakdown during retorting

PURITY NCS is an unusually stable starch thickener—doesn't thin out when canned foods are retorted. Instead, its thickening power increases to surpass that of regular corn starch at retorting temperatures. The result? Upgraded packs made with 10-20% less starch.

PURITY NCS helps safeguard the shelf-life of retorted foods. Reduces weeping or separating. Maintains an appetizing flow even after many months of undisturbed storage.

PURITY NCS is ideal for cream style corn, cream style soups, rarebits, baked beans, stews, gravies, sauces. Why not test it immediately? Write for a sample and data sheet.

National
STARCH PRODUCTS INC.

270 Madison Avenue, New York 16 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

When inquiring check 4817 opposite last page

There are some who deplore the "sensational" advertising of Roberts Dairy low-fat products. So that the reader may judge for himself, we have included some of their recent full-page newspaper advertisements in the article which begins on the facing page.

Before passing judgment, we suggest that the reader compare this advertising campaign with typical advertising promoting without qualification fat-rich foods to the general public.

We will be interested in hearing from you readers who have views on this subject, and will publish those of general interest.

The Editors

*The three articles published in January, March, and April issues of FOOD PROCESSING are available in a 12-page reprint "Crisis for Fat-containing Foods". For a copy remit fifty cents to The Editor, FOOD PROCESSING, 111 East Delaware Place, Chicago 11, Ill. Quantity prices on request.

PREMATURE

to lower fat content of food products

Recent medical findings are generally in favor of lower fat in the diet of many people. This calls for a reformulation of some food products asserts J. Gordon Roberts, who is actively promoting products with reduced fat content.

J. GORDON ROBERTS
President and Chairman of the Board
Roberts Dairy Company
Omaha, Nebraska

THESE 4 LOW-FAT DAIRY PRODUCTS ARE HEART OF THE "ROBERTS PLAN"

VADA — a milk product that contains one-half of 1% butterfat — just enough so that it can be homogenized. The solids are increased by the vacuum process, vitamins A and D added.

IMAGE — an all-dairy spread containing 18 times as much protein as either butter or margarine, 5 times as much calcium, 61% fewer calories, and less than one-third of the fat. Spreads nearly as well at refrigerator temperature as at room temperature. First introduced to the public last January, over 100,000 cartons were sold within two months.

CHILL-LO — an iced milk product with 3½% butterfat content — 70% less fat than ice cream. (In Nebraska, ice cream must be 12% butterfat.) In vanilla, chocolate, and strawberry flavors.

ROBERTS 2+ — a fresh dairy drink with higher protein and mineral content, but containing 38% less butterfat than regular bottled milk. Contains amounts of vitamin A equaling whole milk, plus extra units of vitamin D.

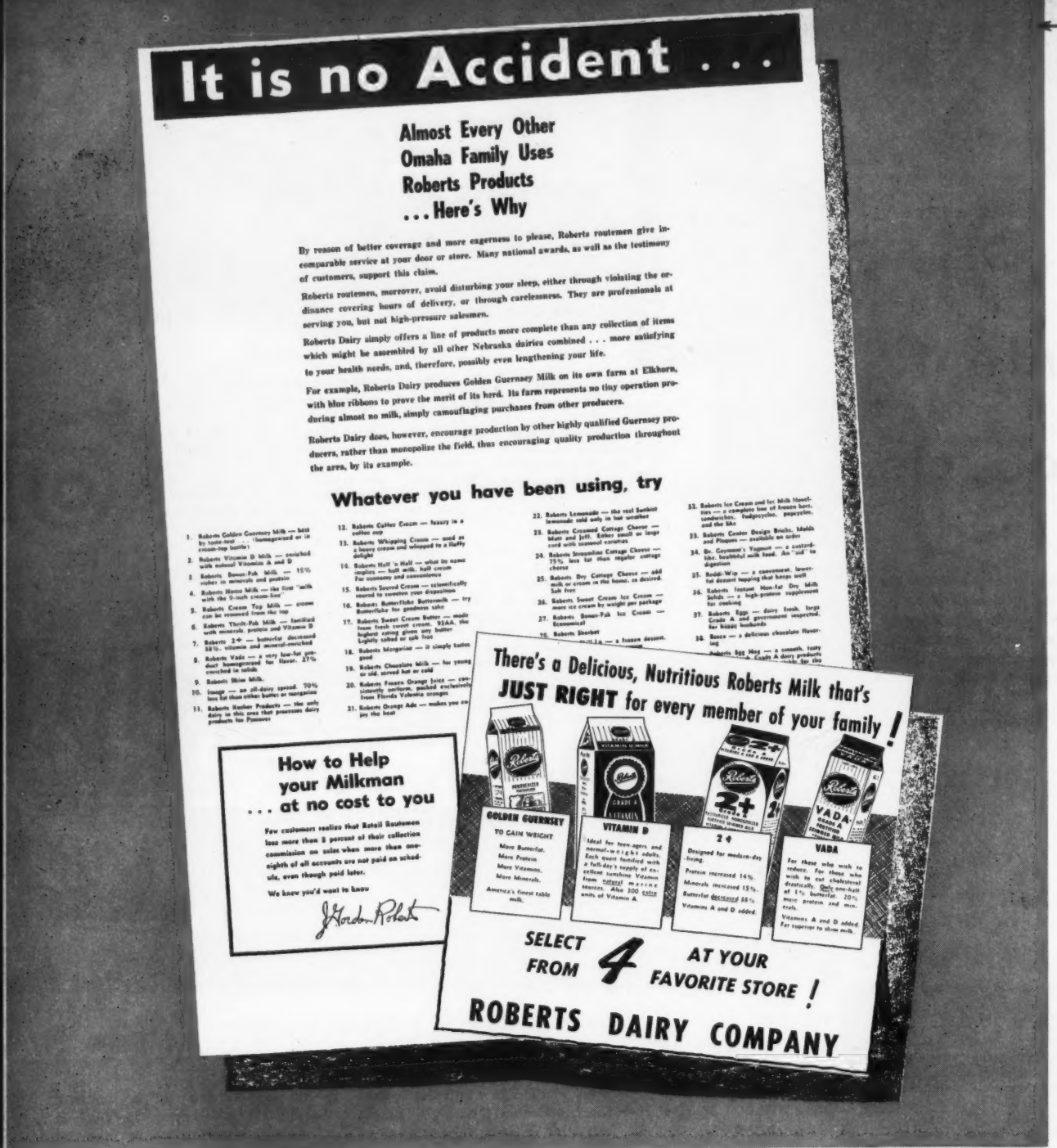
J. Gordon Roberts is active on regional and national committees connected with the dairy industry and public affairs. He is a member of the Board of Directors of the Dairy Society International. In June, he was appointed to the President's Citizens Advisory Committee on the Fitness of Youth. Roberts Dairy Company, which he heads, has general offices in Omaha, Nebr. Plants and offices are also maintained in Nebraska at Waterloo, Grand Island, Lincoln, Stromsburg, and in Sioux City, Iowa. This year marks the 51st anniversary of the company.

In various articles (see footnote* opposite page) which FOOD PROCESSING has published on the subject of "Crisis for Fat-containing Foods?" you have advocated a prudent policy for the food industry in approaching developments in fat-containing foods. You state that the present knowledge is hardly the basis for any sweeping changes in food products . . . that there is insufficient evidence to warrant making changes at this time.

We disagree. In our judgment a fire truck should not be announced by a tinkling bell. If a danger is real it should warrant some form of alarm which will get attention. The siren should not be silenced on the off-chance of a false alarm, particularly when the alarm is turned in by members of the fire department!

We think that the food industry should recognize what the public considers to be literally a matter of life and death . . . then attempt to do something about it. And that is what we have done and are

(Continued on next page)


It is no Accident . . .
Almost Every Other Omaha Family Uses Roberts Products . . . Here's Why
By reason of better coverage and more eagerness to please, Roberts routemen give incomparable service at your door or store. Many national awards, as well as the testimony of customers, support this claim.
Roberts routemen, moreover, avoid disturbing your sleep, either through violating the ordinance covering hours of delivery, or through carelessness. They are professionals at serving you, but not high-pressure salesmen.
Roberts Dairy simply offers a line of products more complete than any collection of items which might be assembled by all other Nebraska dairies combined . . . more satisfying to your health needs, and, therefore, possibly even lengthening your life.
For example, Roberts Dairy produces Golden Guernsey Milk on its own farm at Elkhorn, with blue ribbons to prove the merit of its herd. Its farm represents no tiny operation producing almost no milk, simply camouflaging purchases from other producers.
Roberts Dairy does, however, encourage production by other highly qualified Guernsey producers, rather than monopolize the field, thus encouraging quality production throughout the area, by its example.
Whatever you have been using, try
How to Help your Milkman . . . at no cost to you
There's a Delicious, Nutritious Roberts Milk that's JUST RIGHT for every member of your family!
GOLDEN GUERNSEY
TO GAIN WEIGHT
VITAMIN D
2 ¢
VADA
SELECT FROM 4 AT YOUR FAVORITE STORE!
ROBERTS DAIRY COMPANY

Hard-hitting newspaper ads, shown at left and right, are typical of those run in 20 major cities in Roberts Dairy distribution area

our distribution area on Jan. 1 of this year:

"For many years, doctors and dietitians have warned us against eating too much fat . . . consuming too many calories.

"In my own case, I know that I should have long ago heeded their advice. Unfortunately, my liking for good food too often wins out over my good judgment.

"So maybe it was a selfish motive that prompted me to assign a special project to members of our Research Department back in 1951 . . . I suggested that they develop an all-dairy spread lower in calories but superior in nutritional value to anything on the market.

Now, after five years of experimentation, this all-dairy spread has been perfected. It provides 18 times as much protein as either butter or margarine. It supplies five times as much calcium. But it contains 61.86% *fewer* calories, and less than one-third of the fat . . ."

This is the way we are using the "Fats in Foods" theme in advertising and promotion of dairy products. We feel that it is far better that the dairy industry publicize such information as was contained in the Saturday Evening Post article than to permit such communication to be taken over by crackpots, and especially those unfriendly to any form of free enterprise.

In our judgment, such advertising as we ran on January 1 and subsequently will help, rather than hinder, the sale of dairy products in the long run. Especially will this be true if other than natural fats turn out to be the darkest villains.

Non-fat dairy solids should be promoted

And such advertising as ours should encourage the dairy industry to do what it should have been doing for twenty years — namely, *advertise the nutritional values of solids-not-fat* in dairy products.

NOT PREMATURE . . .
to lower fat content of food products

(*Continued from preceding page*)

doing in our development of new products.

Furthermore, our current advertising campaigns emphasize this aspect of our business with full-page newspaper ads, truck cards, pamphlets, and radio and television programs.

The Roberts Plan

We are promoting our "Roberts Plan" to the hilt. This is a plan to cut individual fat intake in the diet where indicated rather than eliminate entirely the use of dairy products.

The "Roberts Plan" is built around our most recently developed product "Image", a low butterfat-high solids dairy spread; 2 +, a fortified skim milk; Vada, a vitamin-milk which contains only ½% butterfat; and CHILL-LO, a frozen dairy dessert which contains 70% less fat than ice cream.

Here's how we opened a campaign to promote our products in full-page ads in each of the 20 major cities in

With the spanking of prohibition, the liquor industry learned the importance of warning against excessive use of alcohol. In our opinion, the excessive use of fat of all kinds may endanger the health of far more people in this nation than does the excessive use of alcohol, bad as the latter admittedly is. And, in our humble opinion, all cigarette companies would have been much better off to have recommended moderate use of tobacco than to have subtly promoted such fantasies as the "I enjoy two packs a day . . . they help me hit 500 home runs the last season".

In our opinion, the dairy industry is not guiltless of encouraging people to gorge themselves with fat beyond what is good for them. For years, as an example, the cream line of milk was represented as the standard of milk quality by the industry.

It would seem to us, based on the acceptance of our high-milk-solids products, that the days of selling milk on a high butterfat content are gone. We have been quite amazed to learn how nutritionally conscious most of our customers have become.

You have asked for a reaction to our advertising campaign — and we can tell you that it has been very good. The public seems to be quite concerned about fat intake — and the recent publicity on cholesterol has just aded fuel to the fire.

This heightened interest — which started several years ago with "excess fats", proceeded through the cholesterol stage, and now may be entering a "saturated-unsaturated" phase, or perhaps a "fatty acid" phase — will continue to focus the attention of the consuming public on fat-containing foods.

In developing and selling low-fat feeds, we are not cutting down total sales of dairy products at all, but rather picking up sales to people who previously were not using dairy products because of their high-fat content. It should be emphasized that we continue to promote the sale of high-fat products, including Golden Guernsey Milk, to those for whom these products are beneficial.

Are you eating your way to a Heart Attack ?

(Asks the December 1st issue of The Saturday Evening Post)

Cut your Cholesterol*

Follow the "Roberts PLAN"

*Cholesterol is considered by many scientists to influence heart attack

According to a recent article in The Saturday Evening Post, doctors have found new evidence that our high cholesterol (high-fat) diet may be the real villain behind coronary disease.

One specialist goes so far as to say that if everyone were to cut his fat intake by 25% we could reduce the amount of coronary disease by 50% in one generation!

It appears, however, that there are still a number of facts to be determined. For example, experts differ on whether our high rate of heart disease is caused by vegetable fats, animal fats, or the various cooking fats which have been hydrogenated.

Thousands take no chances

While waiting for further research to resolve this question, many medical men have placed their heart patients on low-fat diets in an effort to prevent recurrent attacks. And thousands of adults have voluntarily reduced their fat intake in a wise move to "rather be safe than sorry."

We are convinced that many other persons would like to follow their example, if they could only find a pleasant, painless way. For we all recognize the dangers of overweight. And now authorities tell us that fat can accumulate in our arteries, even if it doesn't pile up on our frame.

Our Research Department has therefore devised a plan to help you turn a high-fat diet into a low-fat diet; — without changing your basic eating habits . . . without

Reduces your fat intak
without changing your

2 Reach for IMAGE; -- the
proved, all-dairy spread th
tains 70% less fat than eith
or margarine, but 18 times
protein and five times as
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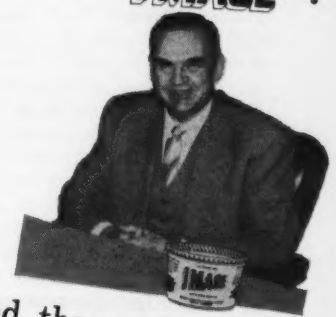
An open letter to the thousands of midwest families who are now using IMAGE . . .



and those who plan to!

Less than 30 days have passed since I offered to share with you the benefits of IMAGE; — the amazing new "all-dairy" spread that contains 61.86% fewer calories, and 70% less fat, than either butter or margarine.

But your response to this offer has already exceeded my fondest expectations. Our carton suppliers, our manufacturing plants and our routemen have barely been able to meet the overwhelming demand!

To the thousands of midwest families who tried IMAGE; found it to be everything we claimed; and have now made this product a continuing part of their daily diet; I wish to extend my personal thanks and appreciation.

And to those who are yet to enjoy this all-dairy spread for the first time, I want to repeat my original offer. Buy it. Try it. Should you dislike IMAGE, return the unused portion to the person from whom you purchased it and your money will be cheerfully refunded.

Although not recommended for frying, IMAGE is a delicious, nutritious spread for bread, biscuits, toast, crackers, and the like. Many of our customers have written to say that they have also used it successfully in making cakes, frosting, cream sauce, and other dishes where it provides a "rich" flavor while drastically reducing calories and fat. In the near future, we plan to supply you with some of these recipes.

Meanwhile, I hope you will continue to experiment with IMAGE and to keep us advised as to your results. And I thank you again for your confidence and patronage.

J. Gordon Roberts

Roberts Dairy Company

Recommendations Regarding Fats in the Diet

by country's foremost public health nutrition authority*

FREDERICK J. STARE, M.D.

Professor of Nutrition
and Chairman of the Department of Nutrition
Harvard School of Public Health
Professor of Biochemistry
Harvard Medical School
Boston, Mass.

AT least two factors are involved in our current ideas on dietary fat; the total quantity of fat in the diet, and the type of fat. There are data showing that coronary artery disease is more prevalent in populations which consume large quantities of what are commonly referred to as saturated fats (meat fats, butter, whole milk and cream, and the hydrogenated shortenings and margarines).

A variety of experimental studies with animals also indicates that a substantial amount of fat in the diet, and particularly saturated fats, causes an increase in the level of cholesterol and lipids (fat-like substances in the blood. This process is thought to accelerate the development of atherosclerosis. When the fat content of the diet is reduced, or when fats containing relatively large proportions of certain unsaturated fatty acids (corn oil, cottonseed oil, peanut and olive oils and some marine oils) replace a substantial portion of the saturated fats, blood levels of cholesterol are lowered.

This phenomenon has been observed in both experimental studies in animals and clinical studies in man, though the latter have been on *few* patients for relatively *short* periods and generally when receiving a formula-type diet something like those used in infant feeding. These interesting observations have not been seen to any extent on a diet of mixed foods as ordinarily consumed.

Decrease in blood cholesterol following the use of unsaturated fats is thought to be caused at least in part by the "essential fatty acids", which are present in some of the unsaturated fats in relatively large quantities, though there are suggestions that other components of these oils are also involved. However, generous amounts of these unsaturated fats provide generous amounts of calories, and generous amounts of calories regardless of their source will cause weight gain, which in turn may increase serum cholesterol as well as being undesirable from many points of view, including the unquestionable increase in mortality associated with overweight.

Many factors involved in heart disease

The public health significance of these interesting findings is by no means solved. There are observations suggesting that other factors are also involved in the prevention and causation of atherosclerosis. Thus, changes in body weight, exercise habits, carbohydrate and protein quality, endocrine activity, and hereditary factors may also be involved in varying degree. Further, most of the clinical studies on this newsworthy subject have dealt with relatively short-term changes in certain blood lipids, particularly cholesterol, and not the clinical cyndrome of coronary artery disease. Most of the experimental studies have likewise dealt with changes in blood lipids, though here some autopsy studies on the actual incidence and extent of atherosclerosis have also been done.

Thus, we should keep in mind that in man it is the coronary thrombosis causing a fatal infarction of the heart muscle that is the cause of death. Whether the infarction will be fatal depends on its location, size, and the ability of the heart tissue to develop a collateral circulation.

All of the current excitement over dietary fat and atherosclerosis is over rather limited studies on experimental production of atherosclerosis in animals, short-term changes in blood lipids on relatively few subjects generally on formula diets, and over epidemiologic and statistical studies done as well as can be done but in which the initial data may be none too accurate. While these are stimulating advances in research, and may be good clues, they may not be entirely relevant to coronary thrombosis in man.

Diet recommendations depend on individual

What recommendations can be made, if any, to the public on the basis of present information and the trends of current research?

• It does not seem justified to recommend drastic changes in the quantity or type of fat in the diet of the general population on the premise that such changes will definitely lessen the incidence of coronary artery disease.

In general terms, those groups of adults who are not overweight, have no strong family history of early deaths from cardio-vascular disease, and have levels of blood cholesterol of the order of 225 mg. percent or less need make no changes in their diet, this on the assumption they consume a variety of foods providing a balanced diet.

*Based on remarks presented to Millers National Federation Annual Meeting, May, 1957

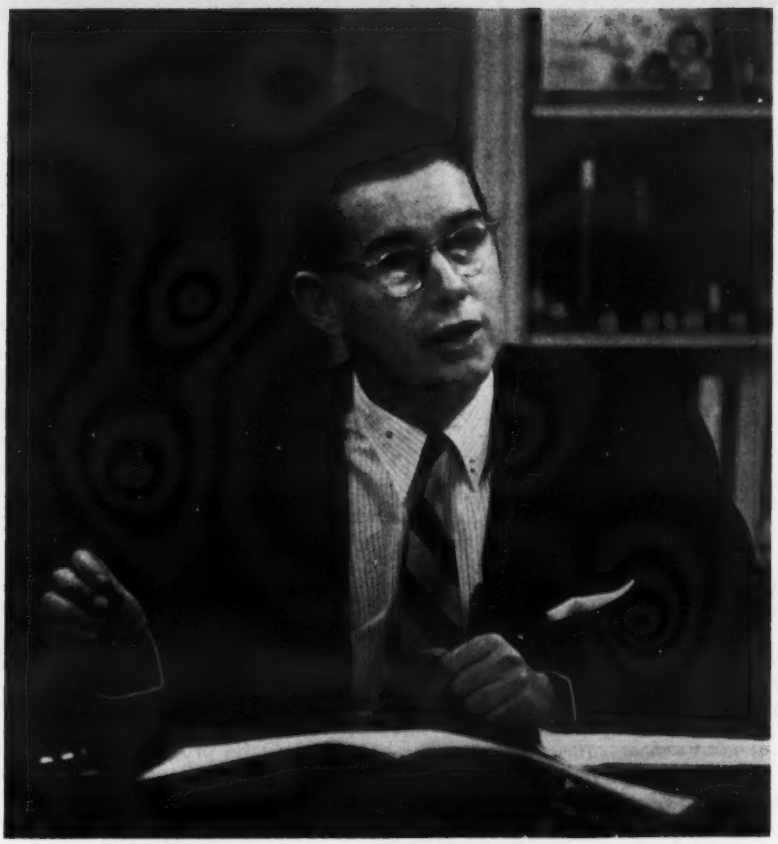


Photo courtesy "U.S. News & World Report"

Dr. Frederick J. Stare has an international reputation for his work in nutrition as a biochemist and physician. The World Health Organization has called on him to report on health and nutrition in Africa and to help train health workers in Indonesia. At the close of World War II, he was US member of a team responsible for relieving starvation in Holland.
He is special Advisor to the Interdepartmental Committee on Nutrition for National Defense; member of Food Nutrition Board of the National Research Council; member of the Nutrition Committee of American Heart Association. He is consultant to the US Public Health Service and a member of the Nutrition Committee of the American Red Cross. He is editor of "Nutrition Reviews", a monthly publication of the Nutrition Foundation.

• Those who are overweight with cholesterol levels as mentioned above might well get their weight down on any type of a well-balanced diet.

• Overweight individuals with cholesterol levels appreciably and consistently elevated and individuals of desirable weight but with consistently elevated cholesterol levels have somewhat more reason to try to lower them, particularly if there is a strong family history of early death from cardio-vascular disease.

• Individuals who have had a "coronary" are really in the class of "patients" and recommendations for them should be on an individual basis and should come from their doctor.

• The specific recommendations for a specific individual can only be made intelligently after first hand information is available on that individual and such recommendations should come from the individual's physician.

Three diet changes to be considered

What are the dietary changes that can be tried in individuals who may fit in some of the above categories.

First, weight loss on any type of a well-balanced diet; that is, "cutting down, not cutting out" with regard to one's food intake.

Second, weight loss on a diet of less total fat (25 to 30% of the calories from fat rather than the customary 40 to 45%) or maintenance of weight (assuming it is in the desirable range) on a diet of less total fat.

Third, any of the above procedures but with a definite attempt to replace the saturated fats in the diet — butter, whole milk, meat fats, egg fat, and to a lesser extent, margarines and vegetable shortenings since they generally contain some unsaturated essential fatty acids — with these unsaturated fats that are good sources of essential fatty acids, particularly linoleic acid.

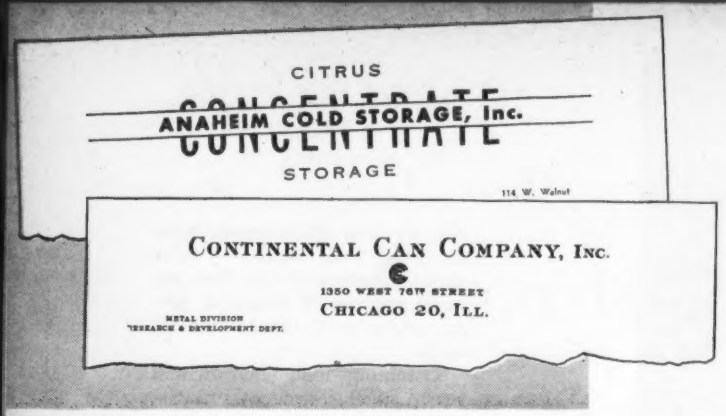
Common food fats which are a good source of unsaturated fatty acids are cottonseed oil, corn oil, and various nut oils and the oils and fat of some fish. When we mention "to a lesser extent, margarines and vegetable shortenings", we should state that we are aware of the formation of various isomers of linoleic acid in the process of hydrogenation but so little information is available on the biologic activity of these isomers, and there is no evidence that these trans isomers act as anti-linoleic acid compounds, that at this time I do not think we can categorically say they are "inactive" or "harmful".

Improve animal fats by changing feed

Mention may also be made of the possibilities of increasing the linoleic acid content of the common animal fats by including generous amounts of unsaturated fats in the ration of the animal. The same could be said of margarines and vegetable shortenings via changes in processing.

In conclusion

If for no other reason than the avoidance of obesity, there will probably be a trend in this country to "less rich diets" which generally mean "less fat" in the diet. Of course, the "other reason" deals with atherosclerosis and its complications, particularly coronary artery disease. This is where we run into the relative merits of saturated versus unsaturated fats. This is a very active field of current research and one where a statement made today may be shown to be wrong tomorrow, and both statements might very well come from our own laboratories. + + +



RADIATION PRESERVATION

What does industry 1957 actually think of food irradiation work to date, and what type of immediate future does it foresee? For the answers, FOOD PROCESSING has gone to a group perhaps best qualified to judge and to predict in this matter — the research directors of approximately 20 companies now engaged in radiation studies under cooperative agreement

Pillsbury Mills, Inc.

Research & Development Dept., Minneapolis, Minn.

Radiation likely to supplement, not replace, present preservation methods

The most appealing fact about radiation preservation is the ability of the rays to destroy micro organisms without the use of heat. Cereal products are heat-sensitive, and thus this method of preservation appeared to have possibilities in the cereal field.

Our main object initially was to determine what the effects of irradiation were on cereal products at various dosage levels. That is, how irradiation might change the product characteristics.

Cake mixes were irradiated with gamma rays at levels up to 2,000,000 reps. The problems we encountered were color changes and the development of off-odors and off-flavors. Dosages of 100,000 reps and above were found to have an effect on the cake baking properties of the mix. This is partly due to a change in the gelatinization characteristics of the starch, resulting in low volume, wet, gelatinous cakes.

Our results at the present time indicate that the maximum dosage level that can be used on dry mixes is between 30,000 and 50,000 reps. Mixes that were irradiated at 50,000 reps appeared normal in all respects shortly after irradiation, but slight off odors were developed during storage.

Results similar to those we obtained have been observed in many other foods. This at first was somewhat discouraging; however, this has actually pointed out another approach for the use of irradiation — that of low or pasteurization dosages. Low levels on the order of 50,000 to 1,000,000 reps will destroy 90+% of the micro organisms present, but yet the dosages are sufficiently low so that marked flavor or odor changes are not produced. The pasteurization dosages used are, of course, dependent upon the nature of the food and the types of microflora present.

In this manner, many foods might benefit from a "cold pasteurization" process which, when used in conjunction with conventional methods of preservation such as refrigeration and freezing, could increase the shelf life of the foods during storage.

I believe that irradiation rather than supplanting present means of preservation will be more likely to supplement them.

H. E. Bauman

DR. H. E. BAUMAN,
HEAD, FOOD RESEARCH BRANCH

Swift & Company

Research Laboratories, Chicago, Ill.

Radiation preservation of meat awaits solution of flavor change factor

Food processors were attracted to radiation preservation because it offered the possibility of destroying spoilage bacteria without otherwise affecting the food. This was in contrast to currently standard methods of food preservation.

Early in the work on radiation preservation, it was recognized that this hope was not easily to be attained. All foods, to varying degrees, show "side reactions" leading to off-flavors, appearance changes and/or texture changes, etc. Such changes have prevented the commercial utilization of radiation preservation.

Much of the work in recent years has been directed toward finding a way to stop these undesired side reactions. To by knowledge, no broadly effective means has been found.

Attempts have been made to use amounts of radiation insufficient to produce significant organoleptic changes in foods but sufficient to reduce the bacterial population so as to delay spoilage under normal holding conditions, e.g. refrigeration. To date, this approach has not yielded any startling commercial developments in applications to meats.

Perhaps certain limited commerical applications will be made but the broad usage of the process requires the development of means of controlling the radiation-induced flavor changes in particular. In my judgment radiation preservation of meat is "hung up" until this flavor change factor can be solved. While we can hope for a lucky or accidental discovery, a more reasonable approach would seem to lie in increased basic research on radiation induced reactions leading to the compounds responsible for the undesired flavors.

W. M. Urbain

DR. W. M. URBAIN,
ASSOCIATE DIRECTOR OF RESEARCH

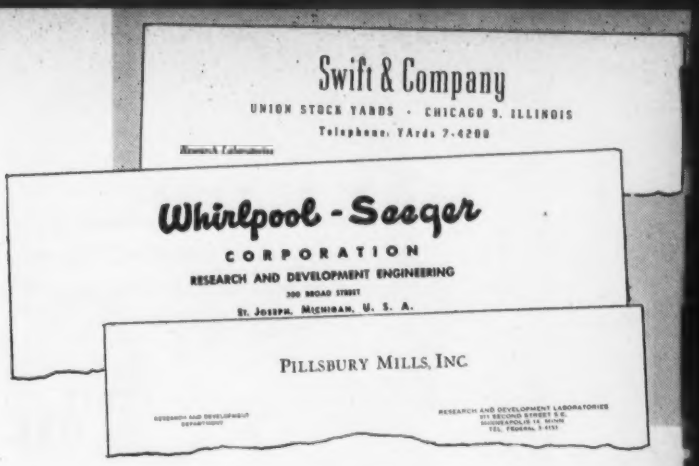
Continental Can Company, Inc.

Metal Division Research & Development Dept. Chicago, Ill.

Metal cans suitable for irradiated packaging at present dose levels

Successful radiation sterilization of canned foods depends upon the solution of problems among which are: 1) The determination of the radiation dose required to provide a safe product in those cases where *Clostridium botulinum* may present a problem; 2) The production of a radiation sterilized product that is superior to presently available canned foods; 3) The clearance of irradiated foods from a public health standpoint; and 4) The economic feasibility of an irradiation process. We are contributing to the investigation of these problems through financial support and cooperative effort with

A REAPPRAISAL
by food industry research experts



with the Army Quartermaster Corps. The first of these informed opinions appear on these pages. Next month, FOOD PROCESSING will present additional statements. In their entirety, they will provide an authentic picture of the processing potential of this new technique. (See page 8 for FDA's studies on food supply safety.)

various university and government groups as well as by work in our own laboratories. It is obvious that a considerable amount of research will be required before radiation sterilization of canned foods can become a commercial reality.

On the basis of our research and results reported by other investigators, it appears that at presently anticipated dose levels metal cans will be suitable for packing irradiated foods. We are continuing our investigations of the effects of irradiation on all can components at the maximum anticipated dose levels.

J. M. HEINEN
Manager, Package Engineering

Whirlpool-Seeger Corp.

Food Laboratory, St. Joseph, Mich.

More basic research on food off-flavors may lead to radiation pasteurization breakthrough

A decade of intensive investigation of the use of ionizing radiations in food preservation is concluding. This period was marked by an initial enthusiasm based on a paucity of information, followed by a tempering of reports with experimental facts. All work to date points to one facet of the process underlying all of its technical limitations.

High energy radiations create random ionizations and subsequent free radical action which, in addition to destroying microorganisms and enzymes, form minute quantities of unknown compounds. These side effects, which have not been sufficiently investigated, are the causes of subjective changes which are detectable even at low pasteurization doses. In many cases, these changes do not render the product unacceptable by itself, but the irradiated product often pales by comparison with an unirradiated control. Such changes may be indications of more fundamental alterations which have occurred in the food.

The randomness of reactions resulting in off-flavored end products indicates that unknown biochemicals could form under a given set of radiation conditions. Each food must therefore be evaluated by itself from a fundamental standpoint. Too much research to date has been slanted towards determining answers known for years, i.e. microorganisms can be destroyed by ionizing radiations, and food will maintain its post-irradiation conditions for extended periods.

Full-scale commercial radiation processing must await results of studies into the basic changes which foods undergo upon the application of ionizing radiations. Even limited-scale operations may require underwriting by the government and, even then, the average American consumer will likely be reluctant to sample a product known to be irradiated. Indications are that radiation pasteurization is the most probable breakthrough point, and, as a result, commercial and domestic refrigeration needs will be greatly increased when and if a breakthrough does come.

DR. A. L. BRODY

Anaheim Cold Storage Inc.

Research Laboratory, Fullerton, Calif.

Radiation preservation of certain food inevitable

Our research program was motivated largely out of curiosity when, in 1954, we engaged Stanford Research Institute to undertake a basic study to determine the bactericidal effect of gamma rays on Penicillium molds associated with fresh lemons. From that moment on, we became emotionally and physically swept up by an experience of indescribable fascination.

This business of sterilizing fruits is not a simple process of directing a lethal stream of gamma rays or high speed electrons at the mold spores presumably incubating on the fruit. It is more like attempting to shoot the proverbial apple off the small boy's head with a clumsy, but powerful bow and arrow. Unfortunately, the stakes are high — the boy is far more perishable than the apple and our aim is not too good.

The problems associated with radiation sterilization of fresh lemons are analagous to the simile mentioned above. The *P. italicum* and *P. digitatum* molds are relatively radio-resistant. Radiation dosages on the order of 800,000 to 1,000,000 rep are required to prevent germination. The important by-products of the lemon peel are, however, far less radio-resistant. Results in other laboratories have indicated that pectins in solution are damaged at radiation dosages one-tenth what is required to prevent germination of spores, and experiments in our laboratories have indicated damage to and release of the highly perishable lemon oils at similarly low dosages.

Other problems have been preserving wholesomeness, characteristic taste, odor, and texture; in the radiation process, achieving uniform exposure to the entire lemon by rotating without damage to the fruit; and determination of dosage received by the fruit on a consistent and reliable basis.

Results to date are encouraging to us because they reflect the narrowing down of fluctuations of past determinations. Problems of dosimetry are being resolved, inconsistent results due to poor technique in irradiation are being eliminated. Improved devices and greater availability of sources of beta rays have cut down on the problem of incident damage to the pectin, peel oil, and juice.

The process is still not a successful one, even though successes have been and are

(*Continued on page* 108)

It seems that eventually legislation will require toxicity determinations to be made on more than a hundred food additives — mostly flavor components now in use. It is thereferoe vitally important for all those concerned with the food processing industry to consider

The Problem of Proving Food A

BERNARD L. OSER, PH.D.
Vice President and Director, Food Research Laboratories, Inc.
Long Island City, N.Y.

IN public hearings held seven years ago, it was alleged that about 704 chemicals were employed as additives to foods and of these only 428 were considered safe as used. The accuracy of this enumeration was questioned in some quarters. It was also intimated that many such uses of chemicals tended to depreciate or adulterate foods rather than enhance their flavor, appearance, stability, nutritive value, or similar beneficial attributes.

Several years later, the Sub-Committee on Food Technology of the National Research Council's Food Protection Committee undertook a more up-to-date survey of the use of chemical additives in food processing. It enlisted the direct collaboration of food companies, trade associations, chemical suppliers, food technologists, and other professional consultants. Whereas this survey, being the first of its kind, was characterized by some degree of innaccuracy and incompleteness, particularly as regards levels of use, it is believed to be the most reliable listing* available today.

**A perhaps excusable timidity curbed the willingness of certain food processing companies to reveal manufacturing practices involving food additives. Now that industry has had a chance to appreciate the usefulness of reliable data on this subject, it is hoped that a revision of this survey, soon to be undertaken, will benefit from the passing of any attitude of reluctance to supply such information.*

One hundred fifty additives in scientific no-man's land

In any case the present NRC Food Protection Committee list names about 500 food additives of which about 300 are in the category of flavoring agents, including aromatic chemicals and essential oils. Some 150 of these substances were described by Food and Drug Commissioner George P. Larrick as being in a "scientific no-man's land" with respect to our knowledge of their safety for use. There is good reason to believe that they consisted almost exclusively of flavor chemicals.

The Food, Drug, and Cosmetic Act provides for the establishment of tolerence for poisonous or deleterious substances added to food if they are required in production or their use is unavoidable by good manufacturing practice. However no tolerance limits have ever been established for flavoring agents. Coumarin became declasse as a result of voluntary action on the part of the major producing companies which led to its exclusion by FDA from the list of optional ingredients in the definition and standard of identity for chocolate and cocoa products.

Subsequently, however, a number of seizure actions have been successfully taken against imitation vanilla flavors on the ground that they contained a poisonous or deleterious substance, to wit coumarin. Were the Food and Drug Administration prepared to prove that any flavoring agent was, *per se,* poisonous or deleterious, more frequent enforcement action leading to their prohibition would doubtless be taken. It must be remembered that the present (unworkable) law does not exempt such a substance however harmless it may be in the amounts used.

For some years an effort has been under way to amend the Food, Drug, and Cosmetic Act to require prior testing for safety and to shift the burden to industry rather than requiring the government to prove toxicity. The bills that have been introduced in this and previous sessions of Congress require the submission of testing data by the petitioner and notification to or approval by the Secretary of Health, Education, and Welfare, prior to use in interstate commerce. Where do flavoring agents stand under these proposed bills?

New approach to safety

Most relevant is the provision common to all definitions of chemical additives in the various bills now before Congress, *viz.* that they must be safe for use under the conditions of intended use. This virtually means replacement of the unworkable and abstract *per se* doctrine by a realistic determination of whether the substance is harmful, *i.e.,* in relation to the amounts and conditions of use. This new approach to the safety of food additives removes a Damoclean sword from over the heads of users of any flavor chemical which might be demonstrated to be poinsonous under the exaggerated experimental conditions employed in toxicological laboratories.

Manufacturers and users of flavoring agents have hoped for a provision in the amended law granting exemption to those substances in use prior to its enactment. Some of the bills have been drafted to cover only new chemical additive, that is, they contain a "grandfather clause" excluding by definition those additives which were in use prior to a given date.

Some additives now in use will qualify for "Grandfather clause"

The Administration-approved version of a food additive bill (H.R. 6747) recently introduced into the present session of the 85th Congress

Additives are Safe

DR. OSER is by training a biochemist with long experience in the fields of nutrition, food technology, toxicology, and the scientific aspects of food and drug laws. He is member of the Food Technology Sub-Committee of the Food Protection Committee of the National Research Council, the Committee on Food Additives of the Institute of Food Technologists, the Committee on Chemicals Introduced in Foods of the Food and Nutrition Section of the American Public Health Association, and the Sous Commission on Antibiotics in Foods of the Commission Internationale des Industries Agricoles. Recently he was appointed Scientific Editor of the "Food Drug Cosmetic Law Journal."

is not quite so magnanimous toward industry although many will argue that it is more reasonable from the standpoint of public interest. This bill would exempt any additive that is "generally recognized, among experts qualified by scientific training and experience to evaluate its toxicity or other potentiality for harm, as having been adequately shown through scientific procedures or through prolonged use in food to be safe for use under the conditions of its intended use."

This recognition of prolonged use without apparent hazard as a criterion of safety for continued use, represents a substantial liberalization of viewpoint on the part of the Food and Drug Administration. It is to be noted, however, that "prolonged use" in this context would undoubtedly be predicated on conditions closely approximating, if not identical with, those contemplated in the new or intended use.

Thus a flavoring agent that may have been employed with impunity in a cough syrup or in a cake icing might not qualify for exemption if it were intended to use it as a milk flavoring agent. It should not be assumed therefore that this bill will permit a listing of flavoring substances whose "prolonged use" justifies their exemption irrespective of the nature of the previous and proposed uses.

There will doubtles be some argument over the meaning of "prolonged" as there has been over the term "generally recognized", in the definition cited above. However, there seems to be no better way to qualify such definitions than to leave something to administration discretion and to provide for legal adjudication if it is abused.

It may also be expected that the natural presence of chemical flavoring substances in fruits, berries, or other foods will be cited as examples of prolonged use. For example, a petitioner for ethyl caproate as an ingredient of an apple ester mixture could contend that such use was established by the demonstration of its presence in apples.

Bearing in mind these two principal features of the proposed definitions of chemical additives as they apply to the exemption of flavoring agents, where does that leave us in a practical sense so far as the magnitude of the problem is concerned? Most of the compounds in current use, such as those listed in the NRC Food Protection Committee's survey, will doubtless seek shelter under the prolonged or prior use clauses of the proposed amendments, depending on which type of "grandfather clause" may be enacted.

Establishing prolonged use for flavor chemicals

Will it be possible to claim for all flavor chemicals in current use a history of prolonged, much less merely prior, use? What sort of proof will be demanded for such use? Will manufacturing or sales records of suppliers suffice or will the food processor himself be asked to tell of his past practices? What about the processor who uses commercial flavor blends of composition unknown to him?

Of course many reference works are available in the field of food formulation and processing which list the names of flavor chemicals, but to what extent does this prove their actual use? Furthermore can the mere name of a manufactured organic chemical suffice to establish identity with a chemical named in a formulary? Proof of identity, according to present Food and Drug Administration requirements in drug and pesticide control, goes far beyond that.

In spite of these questions surrounding the evidence of prolonged use, it may be assumed that a substantial number of flavor chemicals may enjoy exemption under one of the proposed amendments — how many, it would be unwise to predict.

It may be mentioned that current food additive bills do not differentiate among chemical additives as regards their natural or synthetic origin.

(Continued on next page)

The Problem of Proving Food Additives are Safe (*Continued from preceding page*)

From the viewpoint of health protection this is quite logical inasmuch as there is not a prior basis for regarding natural oils, extracts or concentrates as being harmless. Nevertheless it is reasonable to assume that prolonged use can more readily be established for essential oils as a class than for synthetic organic compounds.

Synthetic chemicals the major problem

Hence, the remainder of this discussion will be concerned with the latter category and will disregard, for example, essential oils and other natural products which were included in the Food Protection Committee's classification of flavoring agents. The remainder of the list comprises about 220 compounds of which somewhat over one-half are esters, the balance being about equally divided among organic alcohols (including phenolic compounds), aldehydes, ketones (including lactones), and miscellaneous compounds. Many, if not most, of these compounds have been reported as present in natural fruits and beverages according to recent papers.

Emphasis is placed on recent analyses since it is believed that the newer methods of fractional distillaiton, countercurrent extraction, and chromatography on paper or columns (especially in the vapor phase) permit far more reliable conclusions to be drawn as to the composition of natural flavors than was heretofore possible. Studies of coffee, tea, apples, oranges, raspberries, strawberries, and other fruits have shown that at least 145 different organic compounds contribute to the flavor of these natural products, a large proportion of which are or have been employed in artificial flavors.

I have deliberately avoided specifying or enumerating these compounds and checking them against lists like that of the Food Protection Committee since it must be admitted that such a list can hardly be regarded as complete. Failure to disclose the identity of all flavor additives in use as well as the non-existence or inadequacy of knowledge of the composition of at least some of them are basically responsible for this situation. For instance, it is highly probable that certain mixtures in use undergo reactions such as interesterification, enolization, oxidation, and polymerization as a result of which it is difficult, if not impossible, to establish the exact composition of the end products.

This suggests another problem common not only to flavor chemicals but to food additives generally, namely, the changes that they undergo after addition to foods or during processing and subsequent aging. When this condition prevails, toxicological data on the original substances must be interpreted with some reservation. In fact it has been suggested that animal research should always be directed toward the end uses, that is to say feeding the food treated with the additive to the maximum feasible extent, rather than by feeding the reactive substance itself.

Chronic toxicity studies are expensive

Let us now direct our attention to flavor chemicals for which prior or prolonged use can *not* be established. The usual requirement for chronic toxicological investigations covering at least two species of animals with collateral physiological and pathological observations involves a factor of cost which few manufacturers or users of flavor chemicals seem to be able to justify on economic grounds. Fees for chronic toxicity studies can exceed by many times the total annual sales of a given product of any one company or, in not a few cases, the total dollar volume of all producers.

One solution to this dilemma would be for all companies interested in a single compound to sponsor its investigation on a cooperative basis. This procedure would be indicated where the need for the compound was sufficiently great (as was the case with coumarin) and the potential sales warranted the expense. However, to make such a project effective, it would be necessary to set up suitable identity specifications for the chemical substance to which each manufacturer's product would have to conform. The toxicological investigations could then be conducted on a composite sample of the substance in question and, if its use were approved, only such products as conformed to the specifications would be considered acceptable for use.

Another alternative would be for the Food and Drug Administration to permit toxicological tests of flavor additives to take some form other than the conventional chronic studies. Short-term (90-day) feeding tests employing a sufficient number of animals of at least two species might be considered acceptable and only in cases where the results left doubts as to safety under conditions of use would additional evidence be required. The acceptability of such abbreviated investigations might depend on whether the ultimate uses of the flavor ingredient were sporadic or frequent, and on other conditions of use.

Lower cost with short-cut metabolism determinations

In some instances metabolic experiments of relatively short duration might take the place of chronic feeding studies. While there is relatively little information of a pharmacological or toxicological nature dealing specifically with flavor chemicals, quite a voluminous literature exists on the metabolic fate of various classes of organic compounds. Experiments demonstrating that compounds are either hydrolyzed, oxidized, conjugated or otherwise converted to normal metabolites or into recognized nontoxic compounds might be expected to supplant long-term feeding studies.

Citric, succinic, malic, lactic, acetic, acetoacetic, butyric, and other acids are normal intermediates of carbohydrate and fat metabolism. Hence evidence of hydrolysis by intestinal esterases of the simple

(*Continued on page 41*)

Organic Chemicals Used or Found in Flavoring Agents

Class	Total[1]	FPC List[2]	In Natural Products[3]
Alcohols	39	23	35
Aldehydes	36	23	13
Ketones and Lactones	38	22	10
Acids	34	7	28
Ethers	13	3	—
Esters	222	127	27
Other	49	15	33
TOTALS	431	220	146

[1]From listings in various reference books and catalogs.

[2]Food Protection Committee "The Use of Chemical Additives in Food Processing", Publication 398 (1956), National Research Council, National Academy of Science.

[3]According to recently reported analyses, these figures are minimal.

Will new-formula frozen candies broaden consumer demand and . . .

REVITALIZE the Candy Industry?

*Candies that "explode" flavor warehoused at 15° F, served from refrigerator**

HERBERT KNECHTEL
Consultant
Knechtel Laboratories
Chicago, Ill.

After 30 years as a creative force in the candy industry, Herbert Knechtel here proposes an idea that may revise America's candy-eating habits and the industry's sales figures. His enthusiasm is shared by an eminent researcher on candy problems — Dr. J. G. Woodruff of the Georgia Experiment Station.

Something of an industry rarity, in that he entered the candy field by design, Mr. Knechtel has several top-selling confections to his credit. Most noteworthy was his role in developing the famous "Frango Mints", marketed in the midwest by Marshall Field & Co. Currently head of his own consulting laboratory, he advises several large midwestern and southern clients on candy manufacturing methods and merchandising procedures.

New-formula freezer-merchandised confections, so quick-melting in the mouth that they literally "explode" flavor against the taste-buds, may herald an unprecedented "golden era" for U.S. candy makers.

Impact on the consuming public, however, will be no less than on the industry itself. Manufacturing schedules, marketing methods, promotional techniques — all will be subject to changes that can only be described as revolutionary.

Perhaps a revolution is in order. The candy industry has not been dynamic — especially in promotion and marketing techniques. The consumer is not given sufficient reason why he or she should eat candy at other than more-or-less ritually established times. The very marketing outlets — candy stores or candy counters in theaters and in drug, five-and-dime and department stores — subtly suggest that candy is not a real food item but is somehow "different". As a result, in the past 25 years, annual U.S. per capita consumption of all types of candies has risen only 4.4-lb — from 13-lb in 1932 to 17.4-lb in 1956. A rise, true, but very modest when compared with the sharp upward trend of the soft drink or certain other specialty food industries.

Frozen candies retailed to date have aroused curiosity but not repeat sales. New candies, boasting superior low-melting-point ingredients, will be true frozen confections formulated to taste best served right from refrigerator

*Based on material presented by Mr. Knechtel at the Eleventh Annual Production Conference of The Pennsylvania Manufacturing Confectioners' Association, Franklin and Marshall College, Lancaster, Pa., April 25 and 26, 1957.

(Continued on next page)

. . . revitalize the candy industry (Continued from page 31)

Why Previous Attempts Fell Short

Certain candy manufacturers have refused to share the industry's general complacency. They also have been imaginative enough to foresee the sales possibilities offered by frozen candies at a time when the public is demanding frozen foods. Yet, look into your food market freezer today and you will find cakes, cake mixes, frozen doughs, pancakes, pizzas, meats, fruit juices, ice cream, frozen desserts and complete dinners — but no candy! Why? Because the imagination didn't go far enough. Candy marketed as frozen candy wasn't designed as such. Ice cream, frozen desserts and similar products were designed to be sold frozen and consumed in a near-frozen state. With candy, freezing has been employed as a means of storing not selling.

In my opinion, the approach to this vast, still unexplored market is not in merely freezing a line of candy, but in developing, making and merchandising a line *formulated* to provide top taste enjoyment when eaten cold. Such candies, frozen at the factory, warehoused at 15°F sold from a self-service frozen food locker and kept in the home refrigerator until served, taste better and look brighter than any candy — including foreign brands — on the market today. Made with highest quality ingredients at lower processing temperatures, containing less milk solids and more fats, highly receptive to artificial coloring, they could be promoted at a premium price as a truly delicious frozen food, to be enjoyed every season of the year, with meals as a frozen dessert, between meals as a frozen snack, or while watching TV or a movie.

Their high year-round consumer appeal would help eliminate the all-too-familiar summer "doldrum" period. For the peak Thanksgiving-through-Christmas selling season, extra quantities could be produced in spring and summer and stockpiled in refrigerated warehouses until needed. In this way, a steady force of experienced workers could be maintained throughout the year.

Proved in Practice

Eight years ago I first froze chocolates which were really meant for resale. This merchandise, each box Christmas wrapped, was packed into plain corrugated cartons and stored in April at minus 20°F. Just before Christmas, it was removed gradually, over a period of a few days, until room temperature was reached. When the boxes were opened, the candies were found to be no different than fresh ones. In a triangular-type taste-panel test, the participants were unable to identify the eight-months-old candy.

Subsequently, we used polyethylene liners within the cartons to eliminate the tempering-out (warming up) procedure. Now, the cumbersome polyethylene may be dispensed with in favor of moisture-resistant corrugated board, used with a heavily sized kraft liner and weatherproof glue.

It might seem that this type of manufacture would pose a production problem. Low-cooked caramels and nougats would seem to have to be chilled before cutting would be possible.

However, this apprehension is not justified. Fluted, semi-rigid paper cups, filled by a standard production-line depositor and then conveyed through a cold tunnel or trucked to a cold room, provide a ready and economical answer. The entire operation can be accomplished on standard equipment at regular room temperatures — a low-cost way of making candy that eliminates all cutting and wrapping procedures. Furthermore, participants in consumer preference tests conducted to ascertain how the consumer best likes his candy served have been unanimous in favoring candy which must be removed from direct contact with fluted cups.

Advance guard of "army" of frozen, low-melting-point candies that can mass-assault the consumer dollar are chocolate-covered cream centers, nougats, caramels, fudges, and truffles (left) . . . bright butter caramels, butter nougats, butter fudges (right)

"Pros" Outweigh "Cons"

What about possible disadvantages? Of these, three are important — storage cost, risk of damage, and legal restrictions in labeling such candies as "fresh."

The added costs involved include storage within a commercial cold storage warehouse and trucking to and from the warehouse. Storage charges are approximately 47c/cwt gross weight for the first month (this includes in and out handling charges), then 30c cwt each succeeding month.

The polyethylene liners cost from 6c to 10c each. In other words, boxed candy can be stored at 0°F for six months for approximately 3¼c/lb. This figure includes trucking expense, but does not cover

interest on the money invested in inventory.

Admittedly, frozen candy storage is costly, but the added costs do not offset the desirability of such storage when a premium product is involved and when such storage enables retention of well-trained personnel on a steady employment basis throughout the year. Besides the advantages in quality and quantity of output, there is a saving in elimination of overtime and extras.

On the subject of damage, much depends on the handling. There is very little chance of damage if the merchandise is handled properly. However, during peak selling periods, there is always a possibility of mis-handling. If it is exposed to normal atmosphere too soon after removal from deep-freeze, it will pick up enough moisture to ruin both candy and packaging.

Whether it is possible to sell or advertise candy subjected to freezer storage as fresh candy must be resolved individually. Under Illinois law, for example, it is unlawful to represent or advertise as "fresh" any article of food which has been held under refrigeration 30 days or more. This should be checked with local or state authorities before consideration is given to a freezing program if the "fresh" label is considered essential. However, if the new-type frozen candy is properly promoted by a sufficient segment of the industry, the question of freshness may well become academic.

Each individual candy manufacturer must weigh advantages and disadvantages before making his decision. In my mind, there is no question that low-melting-point candies are a potential bonanza for the industry. It has been gratifying to learn recently that several large producers are already sufficiently interested in the idea so as to begin planning additional facilities to handle this new-type product. + + +

COMMENTS OF INDUSTRY LEADERS

Charles Wesley Dunn

Food Law Specialist

"Personally, I endorse the principle of Mr. Markel's suggestion to improve the food standards law of the Federal Food, Drug, and Cosmetic Act. For it is designed to bring this law into due focus and balance, whereby on the one hand it will secure the product integrity of standardized foods and on the other hand it will otherwise permit their technological development within the general safeguards of this Act. I should like however to review the draft of any bill to implement this suggestion.

"It should be added here: I have long entertained the view that food standards under this Act would be better determined on a responsible and representative scientific (as distinguished from a strictly government) basis, as in the case of drugs. But the opportunity to substitute that scientific procedure was lost years ago; and the alternate government procedure is now firmly imbedded in this Act. Hence all we can presently do is to improve such procedure and that is what Mr. Markel basically suggests.

"Please note that I here speak personally and not as president of The Food Law Institute or general counsel for the Grocery Manufacturers of America."

Frederick W. Specht

Board Chairman and President
Armour & Company

"This law unquestionably should protect the public against deceptive practices and harmful ingredients. But, so long as a product is wholesome and fairly presented to the consuming public, the consumer should be free to decide whether he shall have it, without governmental interference.

"If we are to continue to enjoy the benefits of our free enterprise system, the government should not be permitted to say that consumers shall have a certain product, and not have a certain competitive product that is equally as wholesome and just as fairly presented to the consuming public. To permit this restrains competition; moreover, it discourages the inventive genius which is, and always has been, the precursor of better and more wholesome food products."

Grover D. Turnbow

President
Foremost Dairies

"Mr. Markel's proposals do reflect the thinking of a great many people in the food industry. His thesis is that the inventive ability of the food technologist, working within the limits of economic integrity and physiological safety, can do a better job for both the consumers and manufacturers when unfettered by 'recipe standards' that will be outmoded by pending 'food-additive' legislation.

"There are three bills before Congress which deal with the problem of food additives, and it is generally conceded that one of these bills will become a law soon.

"Our own research program embraces several new important milk derivatives. These new derivatives are nutritionally sound and physiologically safe and will provide, we believe, dramatic improvements in several 'recipe standardized' foods.

"It appears that Mr. Markel believes that the standards of identity which encompass protection against economic dilution only would be adequate for consumer protection. Furthermore, with this new legislation in force, the present detailed 'recipe' standards of identity would go beyond the demonstrated needs for economic honesty in food products.

"It would appear to us, therefore, that the effect of the new legislation on food additives plus the present 'recipe' standards of identity will restrict the food industry more than ever, with even more deadening effect on creativeness. For this reason, we support the basic ideas of Mr. Markel on identity standards for foods. We in Foremost do not want to be unreasonably restricted or delayed in our development of new food ingredients because of some cumbersome legal technicalities arising from the present standards. The best interest of society would not be served.

"If we understand Mr. Markel correctly, he endeavors to distinguish between deceptive foods and the economic integrity of foods, but it appears to us that the article falls short of clarifying this distinction. Some of his references concerning existing regulations are not entirely clear and may cause some misunderstanding on the part of the reader. In fact, we wonder if this article couldn't be written in just a little different form, especially since it is being published in a magazine such as FOOD PROCESSING.

"It is really very difficult to criticize an article such as Mr. Markel has prepared because so many of the items are quite controversial, at least at this time. Our own viewpoint is one that would be taken by the food technologist who is interested both in the progress of the food industry and continued improvements of foods for the benefit of the consuming public.

"The suggestions we have made here parallel some of the outstanding progress that has been made along other lines, such as antibiotics. From a nutritional and food viewpoint, we think that much can be done if restrictions are not placed in the road by people who lack a full understanding of what is desired to be accomplished."

Samuel A. McCain

General Counsel
Corn Products Refining Company

"I think Mr. Markel's thinking on this subject is both constructive and important and one that I have discussed with him for some years. I am sure that in actual practice revision along these lines with regard to standards of identity under the Food, Drug & Cosmetic Law would not only be more flexible but would allow for improvements in standardized products without endangering the food supply in any way.

"Naturally, all the representatives of the companies in the food industry will look forward to a chance to review any proposed legislation along these lines.

"We very much appreciate your calling Mr. Markel's article to our attention."

George Garnatz*

Director, Kroger Food Foundation

"I feel that the suggestions of Mr. Markel are timely and constructive, and merit serious consideration. Anything which will render the process of establishing standards of identity less

*Immediate past president, Institute of Food Technologists

on last month's lead article by Michael Markel maintaining ". . . it is therefore timely to consider suitable amendments restricting food standards to fixing only those factors which are essential to food identity and establishment of economic integrity and thus unshackle the improvement of food products."

cumbersome or less complex would be desirable. If a revision of the standards could provide a degree of flexibility, the processor would have some latitude in selecting his own recipe for the preparation of standard products. This, of course, presupposes that there will be no sacrifice of the public interest.

"A revision, such as Mr. Markel suggests, would in our opinion accomplish the desired result. It would also provide a stimulus to continued research and product development so that the flow of foods in greater variety would be encouraged."

Robert S. Whiteside

President
Sterwin Chemicals, Inc.

"I feel that there should be clearly defined procedures for the control of toxic substances in foods, and the regulations covering safety and purity of foods should apply to *all* foods. To try to accomplish this purpose by the establishment of standards of identity, is to place an unnecessary burden on the staff of the Food and Drug Administration, leave a loophole for non-standardized foods, and virtually eliminate the possibility for the improvement or variation in eating quality improvements in manufacture, or better nutritional value of foods.

"The proposals of Mr. Michael Markel in the June issue of FOOD PROCESSING, in my opinion, represent the desires of both the food processing industry and the consumer.

"We appreciate the interest that FOOD PROCESSING has shown in this problem."

*Reprints of Markel's article may be had by request to The Editor, FOOD PROCESSING, 111 E. Delaware Place, Chicago 11, Ill. No charge for single copies; quantity prices on request.

Charles P. McCormick

Chairman of the Board
McCormick and Company, Inc.

"Markel's article on amending food standards to unshackle the improvement of food products is one which merits serious attention by all food processors. The Department within our own organization that handles the Federal Food, Drug and Cosmetic Law has the following comments to make regarding this subject of food standards:

"The general sections of the Federal Food, Drug and Cosmetic law prohibit adulteration or misbranding of any food. Adulteration means, among other things, the addition of poisonous or deleterious substances which may render food injurious to health; the presence of any filthy or decomposed material; the preparation or holding under insanitary conditions; the use of a container which may render the contents injurious to health; the omission or abstraction in whole or in part of any valuable constituent; the substitution of any substance in whole or in part; the concealment of damage or inferiority in any manner; and the adding, mixing, or packing with a food, of any material to increase its bulk or weight, or to reduce its strength, or to make it appear better, or of greater value than it is.

"The misbranding section states that a food shall be deemed to be misbranded, if its labeling is false or misleading in any particular. This is a very broad statement and virtually all of the related parts of the law, or regulations, are merely delineations of this principle.

"Among these are the requirements for the proper identification of the food by name; the prominent marking required for imitation foods; the form and fill of containers; the name and address of the manufacturer or packer; and an accurate statement of the quantity of the contents. There are also requirements for the listing of the ingredients of mixtures; the declaration of artificial flavors, or colors, and of chemical preservatives; and special labeling for food for dietary uses.

"Within the above limitations, one may make and sell any well packaged wholesome food — except standardized foods. These standardized foods, while relatively few in number, comprise many of the staples of the average diet, such as breadstuffs, many fruits, fruit juices and vegetables, cocoa products, macaroni, noodles, cheese, mayonnaise and ice cream. These foods have standards of identity and composition imposed by regulations promulgated by the Secretary to 'promote honesty and fair dealing in the interest of the consumer.'

"There is no doubt of the need for defining or standardizing some foods, especially mixed foods. There is, however, considerable doubt as to the advisability, or even the authority under the guise of 'promoting honesty and fair dealing,' to standardize the composition of a food so rigidly as to stifle research and to ban improvements.

"A standard should properly provide for a minimum percentage of certain key ingredients to insure adequate flavor, nutritional value, or other desirable properties. This automatically limits the amount of water, or other diluents. The amount of salt, sugar, vinegar, and many other ingredients, are usually self-limiting, as to both minimum and maximum amounts by such factors as taste and keeping qualities.

"Beyond this, the manufacturer should be free to use any suitable, wholesome ingredient in any suitable amount with the same safeguards that apply to unstandardized foods. A substance, or a given concentration, is no safer in unstandardized food than in one for which a standard has been written.

"As an example of the limitations imposed on foods by the present standards, let us consider fruit cocktail. The fruits and the amounts permitted are as follows:

Peaches	30% to 50%
Pears	25% to 45%
Grapes	6% to 20%
Pineapple	6% to 16%
Cherries	2% to 6%

"There is also the requirements that the drained weight be at least 65% of the water capacity of the container, the remainder being syrup. While these listed fruits may well be the usual ones in a fruit cocktail, why should it be illegal to use in addition to the fruits named, in the proper amounts, say 5% of apricots in place of some of the sugar and water syrup, if the packer so desires.

"Such a change certainly would not debase the food. Under existing standard such change may not be made. The apricots above are used only to illustrate the point that no ingredient not provided for in the standard may be used. It is true that there is a mechanism provided for revising a standard, but it is so cumbersome that it is seldom used. The practical effect is to freeze the current recipes and to prohibit improvements. The outlawing of changes tends to kill the incentive for improvements. We should not have stagnation by promulgation.

"We therefore wholeheartedly endorse Markel's proposal to amend the Standards of Identity." + + +

Next month FOOD PROCESSING will publish more commentaries on Markel's proposal to amend the Standards of Identity.

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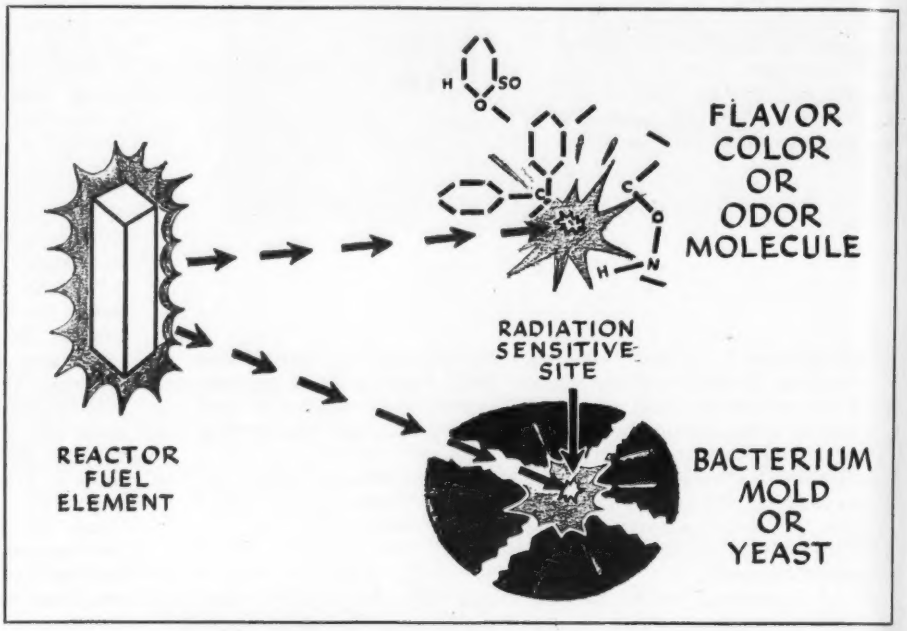


Heart of the problem faced by radiation researchers is the inability of either gamma- or machine-produced radiation to discriminate between a desirable flavor, color or odor molecule and an undesirable bacterium, mold or yeast. Both are disrupted to a greater or lesser degree, depending upon conditions of irradiation and the product irradiated. Hence, research efforts involving sterilization dosages have been concerned with minimizing flavor, color, odor and texture loss or alteration. Although sterilization remains an ultimate goal, radiation's more immediate promise is in pasteurization. Smaller, non-sterilizing doses, applied in conjunction with various conventional processing and preservation methods, could add shelf-life without disturbing organoleptic properties

Current status of Radiation Preservation of foods: Part II*

DR. BRUCE H. MORGAN
Deputy for Radiation Preservation
Office of the Scientific Director
Quartermaster Food and Container
Institute for the Armed Forces

Last month, FOOD PROCESSING presented the first part of a "communique" on the progress of the small but highly trained "army" of investigators probing the frontiers of radiation preservation of foods under Quartermaster leadership.

The previous material was concerned with the most important phase of the program — developing acceptable, wholesome, non-toxic food end items. Following is a consideration of what has been learned to date regarding radiation effect on food components, the chemical nature of sensory changes in irradiated foods, microbiological factors, and wholesomeness and toxicity.

*Based on material presented by Dr. Morgan at the Annual Meeting of the Research and Development Associates, Food and Container Institute, Inc., Richmond, Virginia, April 23, 24, 25, 1957.

Radiation Effect on Food Components

In radiation sterilization, we are introducing into the food molecules enough energy to not only rupture the fundamental binding forces of the molecule, but something of the order of 100,000 times more than that amount of energy. To put this another way, if it takes one shell to sink a ship, we are pouring the equivalent of 100,000 shells into the vessel. All this is necessary for the preservation process, but it also is destructive to the centers of color, odor, or taste in the food. Following are typical of the induced changes.

Carbohydrates

Radiation degradation of carbohydrates could well be implicated in cases of loss of texture of certain irradiated foods, and occasionally change in color and possibly taste.

Irradiation of starch results in a product similar to the modified starches, as exemplified by the increase of its solubility in water. Following a similar pattern, irradiation induces an increased solubility of pectin and cellulose, reflected many times by a softening of apples, beets, carrots, and potatoes. "Threshold" for onset of this change lies between 10,000 to 100,000 rep in solutions of food.

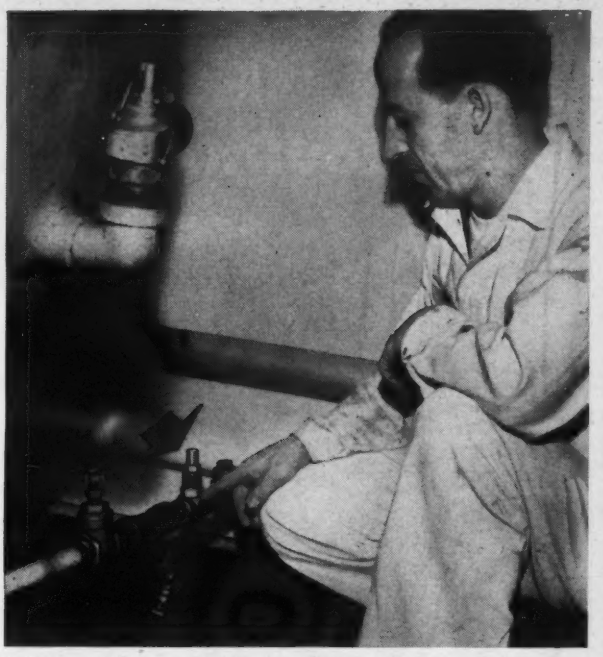
In model systems of these compounds with a very low moisture content, not only does a degradation effect occur during irradiation, but additionally changes initiated by the treatment itself take place for days afterward. Interestingly, at moisture levels above about .3 to .5%, and in the absence of oxygen, post-irradiation changes do not appear to take place.

These post-irradiation effects have been attributed to residual free radicals which are stable under the extremely low moisture and oxygen-free conditions.

In general, when polysaccharides are irradiated, they undergo depolymerization and a number of oxidation products are formed. Sugars in particular fragment, and oxi-

(*Continued on next page*)

"they step up our production — and never let us down"



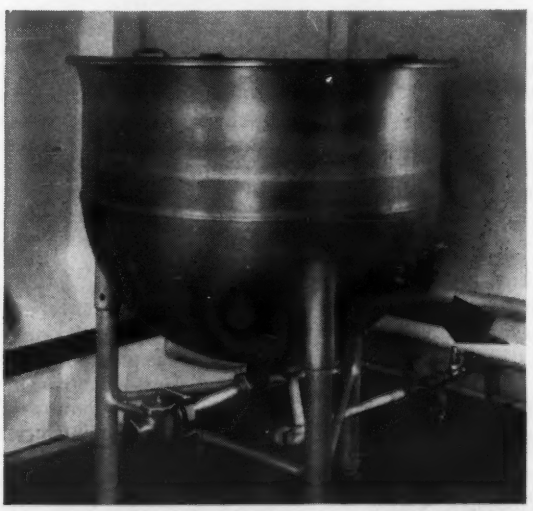
"Yarways bring our kettles to a boil in about 3 minutes instead of the 20 minutes previously required."

Q. Mr. DeJulio, you use a lot of Yarway Impulse Steam Traps here in the FrigiDinner, Inc. plant. How did you first come to use them?

A. I saw an advertisement in a magazine offering a free 90-day trial, and since we had been having plenty of trap trouble, I sent for one. Within two weeks I knew it was our answer. We've purchased only Yarways since then.

Q. Briefly, what's been your experience with Yarway traps?

A. To sum it up, they step up our production, and they never let us down. Our production schedule of pre-cooked frozen dinners is pretty stiff, and time is important. In one case, Yarways cut 17 minutes off the cooking time of every batch. In another, they made it possible for us to double our production of Swiss steaks. Performance is always uniform. We can count on Yarways.



Q. What do you mean when you say, "Yarways never let us down"?

A. Maintenance—or rather, lack of it. We haven't had any troubles. In over two years, I've never had a Yarway trap apart.

Q. Do you have only Yarway Impulse Traps in the plant?

A. No, there are still a few of other makes. But every new trap installed now is a Yarway—soon we'll be 100%!

If you want a Yarway Impulse Trap for a free 90-day trial—or our free book, "The How and Why of Steam Trapping", write . . .

YARNALL-WARING COMPANY
126 Mermaid Ave.,
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**MIKE DE JULIO, Plant Manager, FrigiDinner, Inc., Philadelphia, Pa., manufacturers of pre-cooked frozen dinners.*

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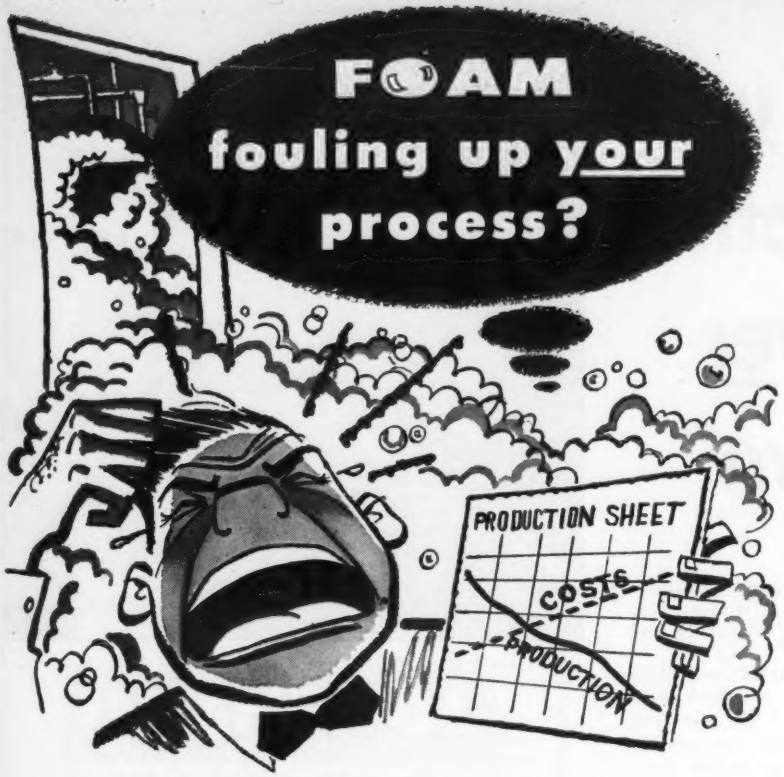
When inquiring check 4819 opposite last page



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Other _____

When inquiring check 4820 opposite last page

(*Continued from preceding page*)

dative products are formed, while reductone-like compounds also have been found. In the glycosidic linkages, both the alpha and beta are broken, although the former is more readily attacked.

Proteins

Undesirable changes in color and odor, as well as liquefaction, may be attributed to protein degradation. A relatively limited degradation of the protein molecule due to irradiation is sufficient to produce a partial denaturization of the protein.

These changes affect acceptance in various ways. For instance, methyl and ethyl mercaptan, dimethyl sulfide, and a host of other sulfides and disulfides have been identified in irradiated meat. Carbonyls have also been found and probably contribute to "irradiation odor". In addition, it may be presumed that condensations occur between aldehydes and amines, mercaptans and sulfides — and these also may result in less-than-desirable odors.

Proteins generally have their viscosity affected by irradiation, tending to produce gels in liquid media due to a cross-linking; when in dry media, they degrade with a loss of viscosity and increased solubility. These changes may well be causative factors in the "drip" problem observed with irradiated meats.

Proteins also appear to be involved in pigment changes, especially in meats. Myoglobin, the primary pigment in meat, is irradiation-sensitive in the presence of oxygen, producing a green pigment, presumably metmyoglobin. A bright red pigment with spectral characteristics similar to oxymyoglobin is also formed, and this may be a hydrogen peroxide addition product of myoglobin. Fresh meats irradiated in nitrogen develop this same pink or red coloration, due probably to the metoxy myoglobin change. Of further interest is the tendency for cooked meats to have some pink color due to conversion of denatured globin-nicotinamide hemichrome to the corresponding hemochrome.

Analysis of irradiated insulin showed that cystine and the aromatic amino acids were most sensitive to irradiation. There is considerable evidence of interaction between the products of irradiated proteins and other food components.

Lipids

Off-flavors and off-odors may result from irradiating fats.

Broadly, when fats are irradiated their natural antioxidants are destroyed, allowing an increase in peroxides. Long-chain carbonyls are formed in large amounts when irradiation takes place in a high oxygen atmosphere, and in smaller amounts when fats are irradiated in nitrogen or inert atmospheres. Further, degree of saturation is important, as saturated fatty acids are less susceptible to change than their unsaturated counterparts. For instance, coconut, although high in fat of a saturated type, does not develop a serious off-flavor on irradiation. Because of the organoleptic undesirability of products of lipid oxidation, it was recommended that all foods containing unsaturated lipids be irradiated in the absence of oxygen and at lower temperatures.

All research to date indicates that although the fat and protein components in a food are affected by radiation, it is presumed that the protein is the more probable site of loss of acceptance.

Chemical Nature of Sensory Changes in Irradiated Foods

Considerable progress has been made in refinement of techniques geared to detection of chemical components that appear to contribute to both odor and flavor in irradiated foods. Many classes of compounds and individual compounds in the homologous series of sulfides, disulfides, mercaptans, alcohols, aldehydes, ketones, amines and

other miscellaneous nitrogenous compounds, aliphatic and aromatic hydrocarbons and esters have been identified. Trace compounds (defined as those below their individual olfactory thresholds) may contribute to over-all odor effects.

Microbiological Findings

Since the principal use of radiation to preserve food involves control of microbes associated with foods, a mass of information in this field is developing. In general, we know that bacterial spores are more resistant than other types of microbes. For instance, to kill 99% of most yeasts and molds requires 250,000 to 500,000 rep, while to achieve a 99% kill of bacteria, in both the spore and vegatative states, a 500,000 to 2,000,000 rep dosage is required.

Clostridium botulinum

As one of the most dangerous microorganisms from a public health standpoint, *Cl. botulinum* is also one of the most radio-resistant spore-forming bacteria known. Recent data indicate that its spores have, in certain foods (at an initial level of 10,000 spores per gram) survived 3,500,000 rep, while in other foods, under the same conditions, the organism was eradicated at 2,800,000 rep.

Further, on the basis of this and other data available, we know that a sterilizing dose of radiation will lie between 3,000,000 and 5,000,000 rep. Exact dose can't be known until we have the capabilities for a large, inoculated pack and do more definitive research.

Rot

Suppression of *Botrytis* and *Rhizopus* rot in strawberries and grapes was achieved with dosages of 200,000 and 500,000 rep, respectively, while dosages of 250,000 rep and 500,000 rep helped control rot, respectively, in peaches and dates. *Alternaria* rot in tomatoes irradiated at 300,000 rep and stored at 70°F was delayed a week beyond its appearance in the controls.

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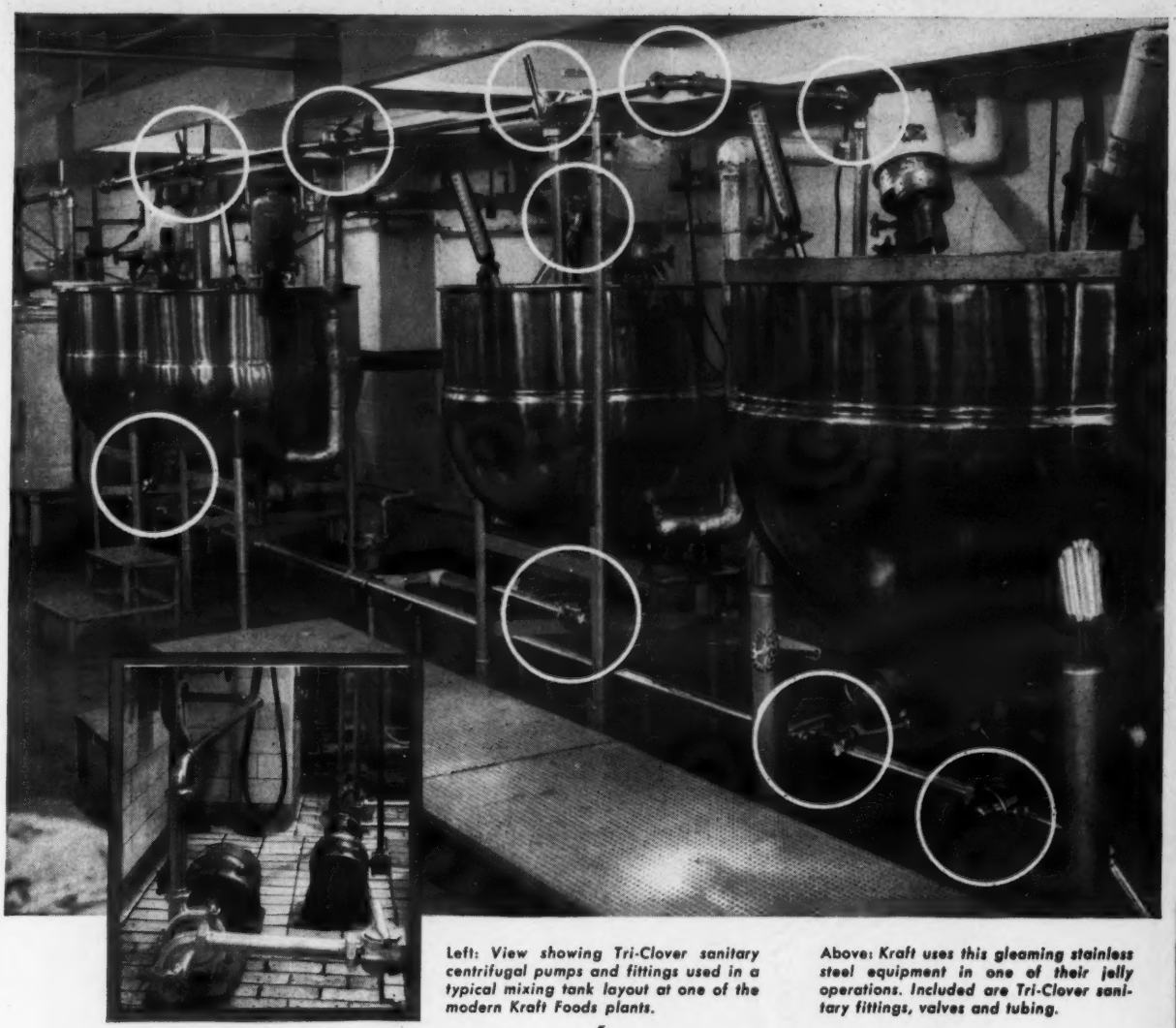

Left: *View showing Tri-Clover sanitary centrifugal pumps and fittings used in a typical mixing tank layout at one of the modern Kraft Foods plants.*

Above: *Kraft uses this gleaming stainless steel equipment in one of their jelly operations. Included are Tri-Clover sanitary fittings, valves and tubing.*

TRI-CLOVER PUMPS AND FITTINGS

help maintain high sanitary standards for KRAFT FOODS

Kraft Foods Company has earned an enviable reputation for constantly high product purity and extremely high standards of sanitation in their many food processing operations.

To help maintain these high sanitary standards and to guard against product contamination, Kraft plants utilize many of Tri-Clover Division's sparkling clean stainless steel sanitary fittings, valves, pumps and tubing. For Kraft has found that Tri-Clover products embody highest quality materials and workmanship and have long met the most strict sanitary code requirements.

Why not let Tri-Clover fittings and pumps help to achieve new standards of efficiency and sanitation in *your* processing operations? Let our engineering staff help in solving your specific corrosion-resistant liquid conveying line problems. *Write for further information.*

S556

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When inquiring check 4822 opposite last page

Radiation

(*Continued from preceding page*)

Fungi

In work with fruits and vegetables involving fungal attack, about 150,000 rep helped control blue mold on lemons and navel oranges. Two-thousand rep gave a significant reduction in rot of apples caused by a similar organism.

Radiation Pasteurization

Another area of interest is that called radiation pasteurization, in which technique not all bacteria, yeasts and molds are destroyed but merely the great majority of them; the rest are retarded in reproducing by employing refrigeration. In meats, this allows the yeasts, normally a minority of the population, to become dominant while decreasing the slime bacteria.

Preliminary results look highly promising for the combination of antibiotics and radiation. One advantage is that each process attacks a different type of microbe.

Wholesomeness and Toxicity Studies

Wholesomeness

Department of Army has conducted intensive tests on nutritional adequacy of irradiated foods, and has observed that the energy value of several meat, vegetable, and dairy products tested thus far remains unaltered by irradiation. Destruction of vitamins is, in general, not greater in processing by radiation sterilization than by heat treatment.

Specifically, long-term feeding of chickens, rats and dogs has demonstrated irradiated foods to be the equal of their respective controls as evaluated by representative tests on factors such as rate of growth, reproduction, hematology, food consumption and food efficiency.

Toxicity

Data thus far obtained from animal feeding experiments do not indicate any production of

(*Continued on page 45*)

 (*Continued from page* 30)

aliphatic esters of these acids would be strongly presumptive of nontoxicity.

A normal defense against foreign chemicals in the animal organism is conjugation or combination with substances which are readily available in the human body such as acetic, glucuronic, or sulfuric acids or with glutamine or cystine. Measurement of the excretion of these end products of metabolism contributes valuable information along toxicological lines.

The metabolic conversion of benzaldehyde to benzoic acid and its excretion as hippuric acid suggests additional applications of a biochemical approach to toxicological evaluation. The similarity of the metabolism of sorbic acid to that of caproic acid, a normal food constituent, was considered acceptable evidence of its nontoxicity.

Another metabolic procedure involves the analyzes of urine and feces to establish the degree of absorption or retention of suspected toxicants. Complete elimination in unchanged form, while not conclusive proof of nontoxicity, provides strong evidence in this direction. Mention must be made of the use of radioactive tracer techniques as well as the more conventional analytical procedures used in this connection.

Cut costs by grouping similar additives for toxicity tests

Finally, as a means of amassing toxicological data on flavor chemicals, the testing of composite samples may be cited. Here advantage is taken of the chemical and pharmacological similarity of compounds within a given organic class such as alcohols, esters, hydrocarbons, etc. The likelihood that they would not interact with each other and would function additively rather than synergistically forms the basis for testing them pharmacologically in groups of say 6 or 8. The blends are prepared in proportion to their estimated levels in the human diet based on their actual or predicted uses.

Feeding levels are some large multiple, e.g. 100 times, the human intake levels expressed on a body weight basis. A negative response to the administration of such dosage is taken to signify that each component of the blend reacted negatively. Thus in one test, data may be obtained on about a half-dozen compounds. If the results indicate toxicity within the group, however additional tests of the components either broken down into smaller groups, or individually, are necessary. Ninety-day studies such as these, now underway in our Laboratories, are yielding valuable data at minimum expense.

Some flavor manufacturers already undertaking studies

In conclusion, it would appear reasonable to predict that not every chemical component of flavoring materials will necessarily have to run the gauntlet of a two-year toxicity study. With respect to those for which safety is not generally recognized by qualified experts or on the basis of their history of use, several possibilties are open. In vitro studies of enzymatic digestion (i.e., studies made in "test tubes" as contrasted to in vivio studies on animals) may reveal the ready conversion of some of these compounds to innocuous intermediate or end products; biochemical or intermediary metabolic investigations of relatively short duration may be employed with a similar objective.

However, with regard to flavor chemicals or mixtures of unknown (but reproducible) composition for which metabolic studies are not applicable, it would seem unlikely that any escape will be possible from the long range toxicological studies required for other types of food additives.

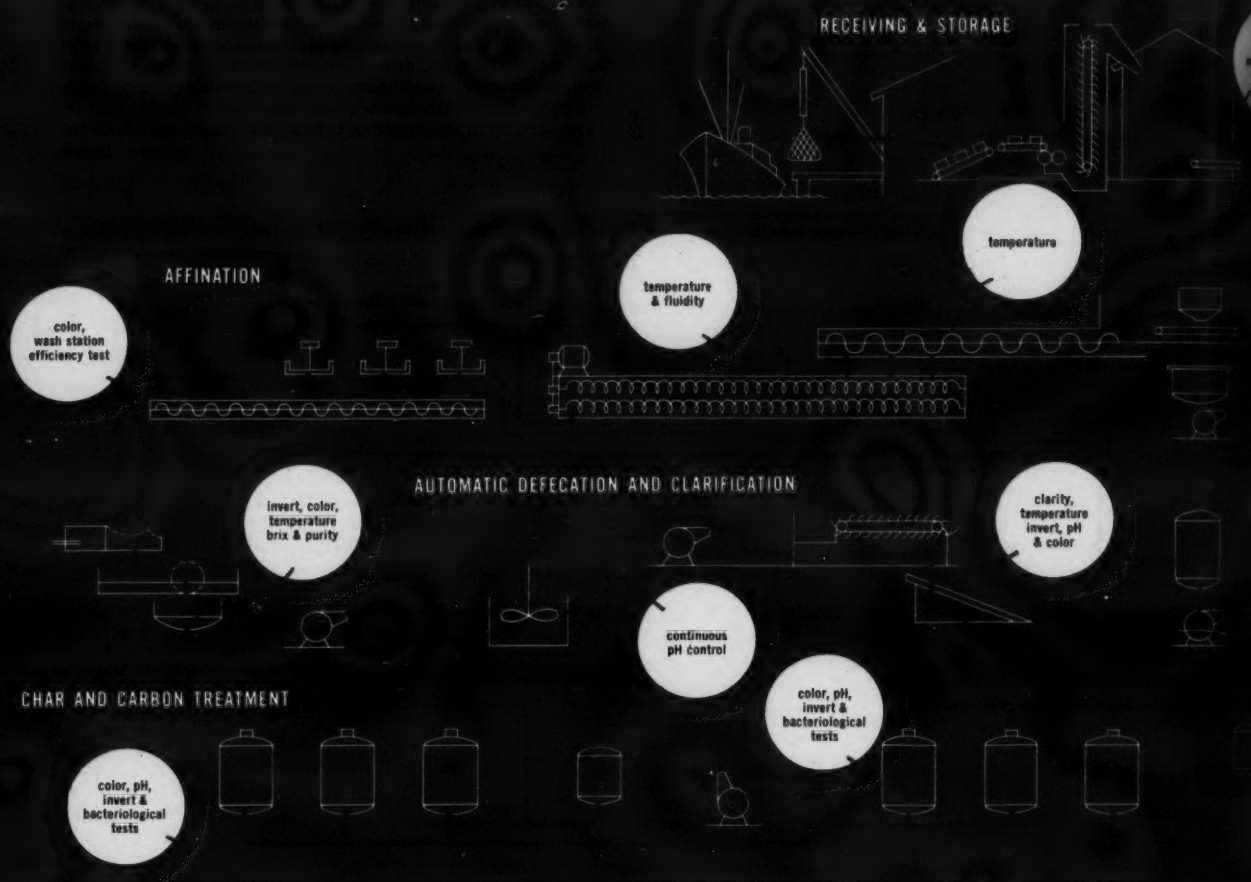
The recent delisting of FD & C Orange 1 and 2, Red 32 and the announced intention of the Food and Drug Administration to delist FD & C Yellows 1, 2, 3, and 4, despite their long history of use as "harmless and suitable" food colors emphasizes only too late that such additives should have been subject to the imposition of maximum tolerance levels. It was only their misuse, through carelessness or ignorance, that produced effects by reason of which the Administration could no longer regard these colors as harmless. While the existence of tolerances can not insure against rare instances of violation, it at least provides protection not only for the consumer but for food manufacturers who use additives properly and safely.

The same principles concerning tolerances may have important application in the field of flavor chemicals many of which, it may be added, contain a built-in safety factor in the form of an organoleptic limit of acceptability.

In any event, it is gratifying to note that some flavor manufacturers have begun to grasp the importance of pending legislation as it affects their business, realizing that sooner or later they will be faced with the alternative of establishing safety in an affirmative manner or run the risk of banishment from FDA's Commissioner Larrick's no-man's land to the purgatory of flavordom. + + +

V 18 7 JUL 57 UMI

FLO-SWEET QUALITY CONTROL STEPS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AFFINATION
temperature & fluidity
color, wash station efficiency test
AUTOMATIC DEFECATION AND CLARIFICATION
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clarity, temperature invert, pH & color
continuous pH control
color, pH, invert & bacteriological tests
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Flo-Sweet's remarkably low turbidity consistently ranks among the lowest in the sugar industry. Here a laboratory technician uses a nephelometer for precise determination of turbidity—a routine check to safeguard Flo-Sweet quality...and thus the quality of your own food products.

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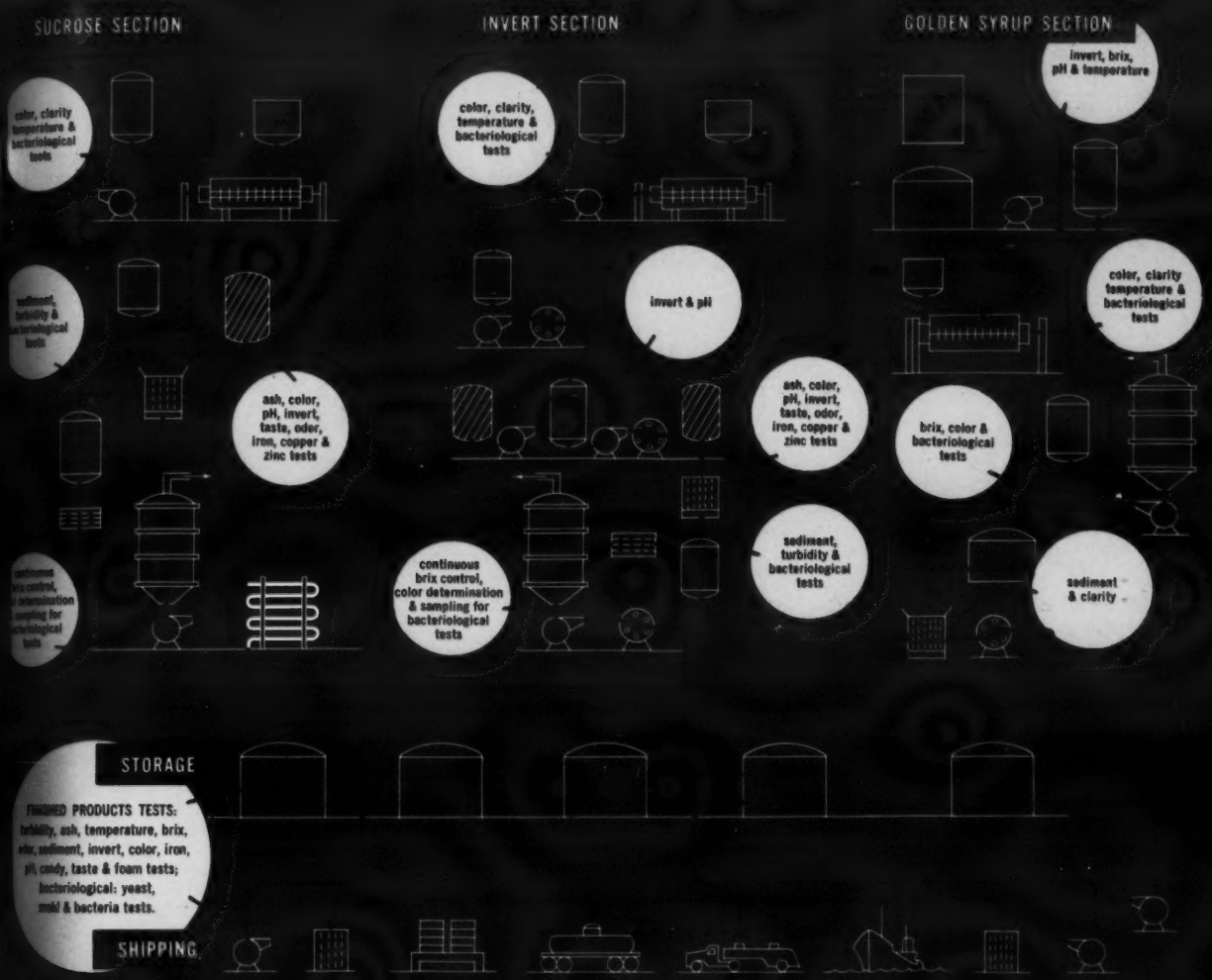
SUCROSE SECTION
INVERT SECTION
GOLDEN SYRUP SECTION
color, clarity temperature & bacteriological tests
invert, brix, pH & temperature
color, clarity, temperature & bacteriological tests
invert & pH
color, clarity temperature & bacteriological tests
ash, color, pH, invert, taste, oder, iron, copper & zinc tests
ash, color, pH, invert, taste, odor, iron, copper & zinc tests
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progr *ormance in your own products—you will find*
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★ Courtesy of the publication MEDICAL ECONOMICS, creator of this copy, here adapted to FOOD PROCESSING

Radiation

(*Continued from page* 40)

toxic compounds by radiation sterilization or preservation. Further, repeated measurements and theoretical calculations reaffirmed that irradiated foods are not radioactive at the energies used.

Four series of human volunteer feeding studies have been completed since May, 1955. Each test covered a two-month period. Conscientious objector volunteers were fed diets of which the irradiated components provided 35%, 65%, 85%, and 100% of total calories. No adverse effects of any kind were observed or revealed through careful clinical and laboratory screening.

The Army has recently undertaken a long-term two-year animal study on 21 foods to secure needed clearance from Office of The Surgeon General of the Army, and Food and Drug Administration. This is a major effort involving over 150 tons of food a year. To date, studies on pork and potatoes irradiated and then stored at room temperature for 3 to 6 months have produced no unfavorable results. As the study continues to produce favorable results, limited troop taste-testing will get underway by 1958, and troop consumption experiments are anticipated by 1960.

Focus on the Future

If I were to attempt to sum up results of work to date, my approach would be this. The negative areas are being found, delineated, and announced, resulting in decreasing effort in these areas. Promising approaches are daily coming into more definite focus, and effort is swinging in that direction. This recognition of the applicable fields for a new process is a normal step in process design. Since we do not claim radiation processing to be a

(*Continued on next page*)

For more information on product on pages 42 and 43 specify 4823 . . . see information request blank opposite last page.

How to protect your foods against down-grading by using pure Diamond Crystal Flake Salt

Diamond Crystal *Flake* Salt has the highest uniform purity of any salt made. Ends danger of costly spoilage and "off" flavor from an impure granular salt or rock salt brine. Improves taste and keeping qualities of foods.

DO YOU KNOW what the calcium, magnesium, copper and iron in an impure salt can do to your products?

These impurities form unappetizing scums and discolorations on vegetables. Slow down curing of meat, make it tough and bitter-tasting. Give frozen fish poor texture and fishy taste. Cause oxidative rancidity in foods containing fats and oils.

Today's food market is keen. Competitive. The quality of your product is one of your best sales weapons. Why spoil it with an impure salt?

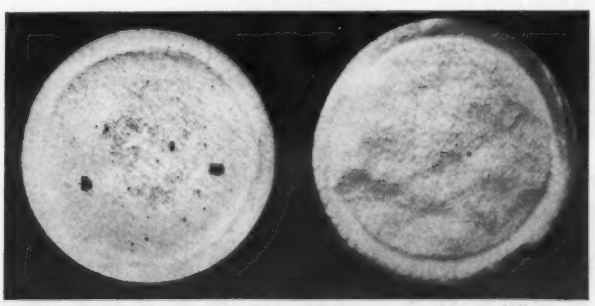
Why flake salt protects quality

Only Diamond Crystal is made by the exclusive Alberger system. This produces flake salt 99.95% pure. An amazing high purity that gives Diamond Crystal *true salt flavor* . . . without the bitter taste imparted by calcium and magnesium compounds, present in less pure salt. By using Diamond Crystal Flake you can *salt to the limit* for optimum flavor.

Diamond Crystal Flake averages less than 1.5 parts per million of copper or iron. Helps prevent oxidative rancidity and off-flavor development.

Are you using the right salt?

The grain size and rate of solubility of salt has an important effect on your product. That's why



Unretouched photograph of actual filter test shows difference in purity and cleanliness between a leading granular, cube-like salt (left); and Diamond Crystal Flake Salt (right).

Notice how impurities in the granular salt used discolored the corn on the left—while pure Diamond Crystal has protected the golden appeal of the corn at right. Which brand do *you* think the housewife would buy again?

Diamond Crystal Flake Salt is precision screened into a wide range of grain sizes to meet the most exacting *individual* requirements of your product.

Send for free analysis

If you are not sure that the salt you're using is suitable for your product, send a sample of it with the coupon below to Diamond Crystal. The salt will be given a careful laboratory test and the results forwarded to you free of charge.

Mail this coupon for free salt analysis

Technical Department FR
Diamond Crystal Salt Co., St. Clair, Michigan

I enclose a sample of the salt I now use. Please have it tested and send me the report free of charge. I would also like information on special Diamond Crystal Salts made for my industry.

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V187 JUL 57 UMI

"Another product safely shipped in Inland 'protection-eered' containers"*

Old Ali Baba never had it so good!

The modern Caravan Products Company of Passaic, New Jersey, producers of TO-TO, a sweet dough base for bakers, doesn't ship by camel. They do, however, provide complete protection for their product, regardless of how it is shipped, with the best shipping container for the job . . . an Inland "protection-eered" pail.

TO-TO contains such ingredients as sugar, shortening, egg solids, flavorings. The baker simply adds flour, yeast and water to make the sweet doughs for his products. Problem was packaging TO-TO so that it would be delivered to bakers fresh, sweet, and positively uncontaminated. Inland solved the problem with a special sanitary pail lining which ships TO-TO as flavor-true and wholesome as the moment it was made.

Lithographing the outside of these sturdy shipping containers in an attractive design and brilliant colors, also solved the problem of brand-name identification, adding distinction and new sales appeal to the product.

If you have a product that requires special protection during shipment, Inland lined containers may be the answer to *your* problems. Learn too, how Inland's complete lithography and design service can *help sell* your product. Write Bob Boecher, Dept. 337F.

**the right container, with the right lining for your product*

INLAND STEEL CONTAINER COMPANY Division of Inland Steel Company · 6532 South Menard Avenue, Chicago 38, Illinois · Plants: Chicago · Jersey City · New Orleans · Cleveland and Greenville, Ohio. *Full line of steel and stainless steel shipping containers, including galvanized and heavy duty ICC drums.*

When inquiring check 4825 opposite last page

Radiation

(*Continued from preceding page*)

"cure-all", we feel we have passed an important milepost by achieving this definition of our problem.

We in the Quartermaster Corps, with our responsibilities in the area of food supply, can see our goals being met as the research effort continues. Furthermore, we can readily see that increasingly intense interest is being generated in the civilian agencies and the free economy. We are looking forward to the day when this interest reaches the point where actual commercialization is realized. + + +

Tin substitute for metal cans

Chemical treatment already being utilized on containers for detergents . . . tests with food products continue

Tinless can is closer to becoming a reality. A chemical surface treatment, "Hinac", is already being used by can manufacturers, including American Can Co., on blackplate for detergent containers. This treatment requires no expensive electrolysis equipment to deposit a corrosion-resisting coating on steel. Coating time requires only seconds, making it adaptable for continuous coil-processing methods (see article "Chemical treatment of Steel", on next page).

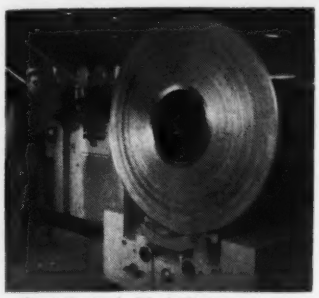
The process may be applied to steel for food containers, stated a can manufacturer's research official. "It's among several materials we are actively researching to produce a tinless container which will be cheaper than the present food can."

(Hinac Process is described in a progress report issued by Heintz Manufacturing Co., Dept. FP, Front St. & Olney Ave., Philadelphia 20, Pa. . . . or check 4826 on form opposite last page.)

Will begin chemical treatment of steel, states Canco's Stolk

First installation at new Indiana coil-cutting plant

Equipment for handling, chemically treating and cutting coils of steel plate for making cans is being installed at American Can Company's



7½-ton coil of tinplate moves into position at Canco's Tampa, Fla., plant — first complete coil-processing line in the can manufacturing industry

new Hammond, Indiana, plant. These operations at present are done at the steel mill. Cans produced will be tinless.

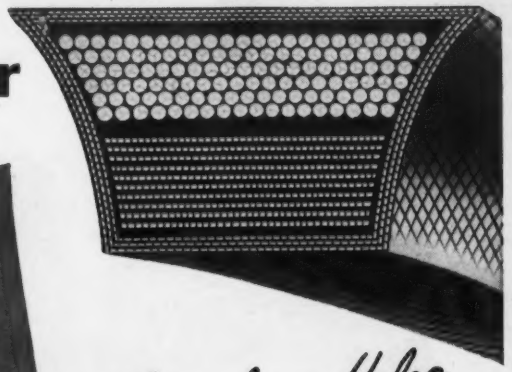
Chemical treatment is another step, according to William C. Stolk, Canco's president, in a revolution that will render present day can manufacturing operations obsolete. These changes are a means the company is using to combat rising prices for steel, as well as bring greater economy to can making operations.

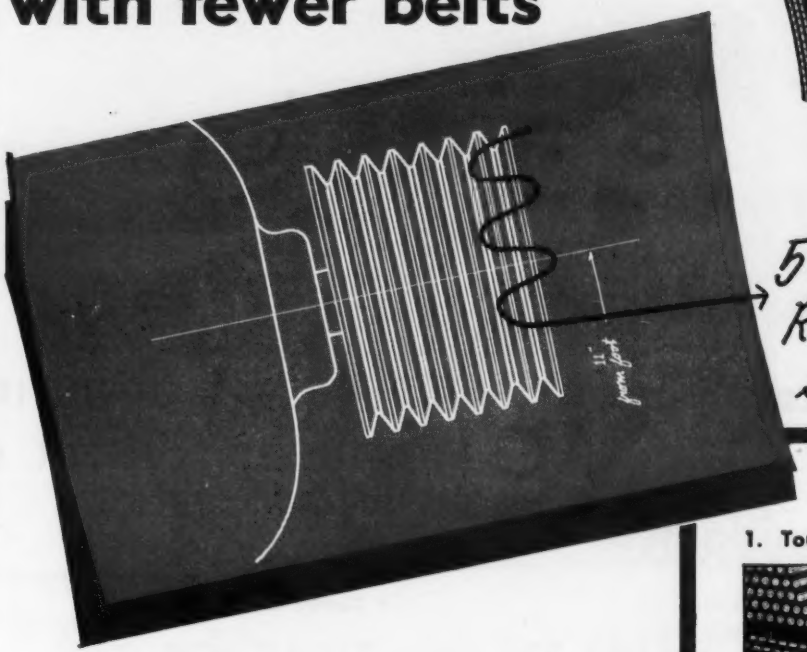
The initial step to handle coil, instead of sheet steel, was started in May, when Mr. Stolk opened the addition to Canco's Tampa, Florida, operations. ✦ ✦ ✦

'Letters from Readers' . . . appear for the first time beginning on page 14. Watch for this column each month . . . and remember the editors always welcome comments from their readers.

Cut sheave width and weight . . .

get same horsepower with fewer belts





5 Gates Super Vulco Ropes do the work of 7 standard V-belts

Where space is limited and weight a factor, design your drive with this important fact in mind:

5 Gates Super Vulco Ropes do the work of 7 standard V-belts

That's because a Gates Super Vulco Rope has 40% more horsepower capacity — delivers more horsepower per dollar invested than any standard V-belt drive. Sheaves with fewer grooves cost less . . . weigh less . . . take less room. Drive design is invariably improved.

A wealth of drive data is quickly available to you. Simply call your nearby Gates distributor for a Gates V-belt specialist. Stocks carried in industrial centers around the world.

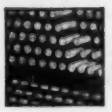
The Gates Rubber Company
Denver, Colorado

GATES Distributors are in the Yellow Pages

The Mark of Gates Specialized Research

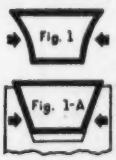
No other V-Belt has ALL these advantages

1. **Tough, resilient Tensile Cords**



Super strong resilient tensile cords provide 40% greater horsepower capacity . . . easily absorb heavy shock loads . . . reduce number of belts required . . . save weight and space.

2. **Concave Sidewalls (U.S. Pat. 1813698)**



Concave sides (Fig. 1) increase belt life. As belt bends, concave sidewalls become straight, making uniform contact with sheave groove (Fig. 1-A). Uniform contact means less wear on sides of belt . . . far longer belt life.

3. **Flex-Weave Cover (U.S. Pat. 2519590)**

A Gates exclusive: provides greater flexibility with far less stress on fabric. Cover wears longer . . . increases belt life . . . more power available to driven machine.

4. **High Electrical Conductivity**

Built into Gates Super Vulco Ropes for safer drives (in explosive atmospheres).

5. **Oil, Heat, Weather Resistant**

Special rubber compounds make Super Vulco Ropes highly resistant to heat, oil, and prolonged exposure to weather.

TPA 248

Gates Super VULCO ROPE Drives

When inquiring check 4827 opposite last page

Open new markets with the help of EASTMAN antioxidants

Ever develop a food product which could be given only local distribution—or perhaps couldn't be marketed at all—because of limited stability? If so, it probably contained an oxygen-sensitive ingredient, such as an oil or a fat, which caused the trouble.

Let Eastman help you combat this problem with its complete line of Tenox antioxidants. Our staff of food technologists would welcome the opportunity of working with you on the proper use of these antioxidants. Assisting other food processors in this manner, we have helped send many fine products from the laboratory shelves to the market place.

Since Eastman manufactures the widest range of antioxidants, we have no axe to grind in favor of any one. You can be certain our recommendation will represent the most economical and effective stabilization possible against oxidative deterioration.

For more information about Tenox, write to Eastman Chemical Products, Inc., Kingsport, Tennessee—a subsidiary of Eastman Kodak Company.

Tenox Eastman food-grade antioxidants

When inquiring check 4828 opposite last page

A few of many Torula grades and vitamin-protein content available to processors. This selection is increasing as improved methods of producing Torula are found

Torula yeast simplifies protein and vitamin enrichment of foods....

- **Makes protein foods taste better**
- **Is available in many different edible grades**
- **Fortifies at low cost**

J. M. HOLDERBY, Vice President
PAUL PAVCEK, PhD Nutritionist
Lake States Yeast Corporation
E. W. NORDLINGER
Assistant Editor

The nutritional yeast, Torula, now can be specified with varying amounts of thiamine, riboflavin, and/or niacin. This is the yeast which received one of the most extended investigations ever made by the US Pharmacopoeia Committee before publication last August of its acceptability as a food ingredient.

Accompanying table shows a few of the many possible variations of vitamin content. Torula can also be smoked, hydrolyzed, and otherwise processed to produce a variety of flavors.

Exact quantities of Torula to include in specific food formulas have not as yet been pin-pointed. However, its protein and vitamin content suggests utility in nutritional up-grading of baked foods, cereal, products, sausages, canned meats, and many convenience items.

The technology of Torula yeast has been under intensive investigation in US for about 15 years (see accompanying box). At the same time that more efficient production methods than used in Europe were being studied, Torula suitability for both animal and human diets was being researched.

Early studies were made on animals to improve feed efficiency and growth. Animal tests have been made on rats, chicks, pheasants, turkeys, mink, trout, cattle, dogs, and cats. Results show that Torula can lower feed costs for weight gained, improve taste and appetite appeal when combined with regular rations, and stimulate growth of desirable micro-organisms within the digestive tract.

Animal research was followed by human studies checked by clinical observation. Specific applications in human foods are still being investigated, and new uses are continually being developed. Broadly, it can be said at this time that:

1. Torula provides desirable low cost protein and B-vitamins in most prepared

(*Continued on page* 51)

Sample of Analyses of Various Torula Grades Guaranteed Potencies Expressed in milligrams/gm

Type	Thiamine	Riboflavin	Niacin	Protein
B	0.15	0.05	0.5	50%
50	0.15	0.10	1.0	50%
200	0.60	0.10	1.0	50%
300	0.90	0.10	1.0	50%
361	3.00	6.00	1.0	50%

Torula, a Result of Cooperative Research

The nutritive yeast, Torula, as presently produced in U.S. is the result of a cooperative study among paper pulp mills. Traditionally, only half of the log is utilized in the pulping operation. The most promising component of the other half is the sugars, both 5- and 6-carbon molecules. (One of the wood sugars already a well established food is from the maple tree.)

Research on these wood sugars was fostered by the Sulphite Pulp Manufacturers' Research League—set up in 1939 at Appleton, Wis. J. M. Holderby, a chemical engineer with the Wisconsin State Board of Health, was selected to head the research.

The most promising use for this sugar was as food for the growing of yeasts. Many yeasts were secured and studied; genus finally selected was **Torulopsis utilis.** Based on previous European studies, this yeast had many nutritional properties and could be grown on both 5- and 6-carbon sugars.

Progress had come to the point in 1945 that the Research League erected a pilot plant to produce Torula at Appleton. The operation led to the formation of Lake States Yeast Corp. and the beginning of a commercial processing line at Rhinelander, Wis. Mr. Holderby was selected to direct this operation and continued as general manager when Lake States was bought in 1950 by Rhinelander Paper Co.

A second commercial Torula plant was begun in 1955 by another member of the Research League in Green Bay. Its operation was described in the January 1957 issue of FOOD PROCESSING.

Types of Commercial Yeasts

Leavening yeasts — live cells which raise doughs by producing a gas (carbond dioxide) — ordinarily of the "common" or Saccharomyces genus.

Fermenting yeasts — live cells which are cultivated to produce alcohol principally — Saccharomyces are usually employed.

Nutritional yeasts — inactivated cell material used as concentrated source of high grade protein and B-vitamins. Three commercial yeasts of this type are produced: primary grown **Saccharomyces;** by-product **Saccharomyces,** chiefly from breweries and distilleries; and primary grown Torula **(Torulopsis).**

New!

FRUITIER! MORE FLAVORFUL EFFECTS!

FOR BEVERAGES AND ICE CREAM

AN ECONOMICAL NEW GROUP OF FRUIT FLAVORS WITH OTHER NATURAL FLAVORS

These new, remarkably true-to-type W.O.N.F. FLAVORS are *custom made* for the beverage and ice cream manufacturer. Long and diligent research into the processing of true fruit extractives and other natural flavoring ingredients now enables us to provide these and other industries with a selection of flavors that insures important economies, much greater convenience, and a measurable degree of flavor improvement in the finished products.

Our FRUIT FLAVORS WITH OTHER NATURAL FLAVORS are made from the finest natural fruit extractives concentrated to optimum strength for maximum flavor quality. They contain less than 50% of added flavor fortification derived from other selected fruits, essential oils and various botanical tinctures.

ADVANTAGES

1. The finished effect — both in taste and aroma — is more natural than that produced by ordinary imitation flavors.

2. They are easier to use because they are standardized as to strength of flavor, color and acidity.

3. Being highly concentrated, they can be stored more easily and at lower cost. Bulkier juices require more space. Furthermore, to avoid spoilage, the latter must be preserved with alcohol which, in turn, reduces available working capital through the necessity of providing cash to cover alcohol tax requirements.

4. Since they are fortified and strengthened with other natural but less costly flavors, they are cheaper in actual use than are the corresponding natural juices.

Manufacturers of

FOUNTAIN and BOTTLERS' SYRUPS, ICE CREAM, MILK SHERBET and WATER ICES, CORDIALS and LIQUEURS are urged to request working samples of these flavors and prove to their own satisfaction their many important advantages.

•

FLAVORS AVAILABLE:

TRUE FRUIT APRICOT W.O.N.F. #26887
TRUE FRUIT BLACKBERRY W.O.N.F. #26880
TRUE FRUIT BLACK RASPBERRY W.O.N.F. #26893
TRUE FRUIT CHERRY W.O.N.F. #26890
TRUE FRUIT GRAPE W.O.N.F. #26891
TRUE FRUIT PEACH W.O.N.F. #26886
TRUE FRUIT PINEAPPLE W.O.N.F. #26889
TRUE FRUIT STRAWBERRY W.O.N.F. #26892
TRUE FRUIT WILD CHERRY W.O.N.F. #26894

ADDRESS US ON YOUR LETTERHEAD FOR TRIAL SAMPLES

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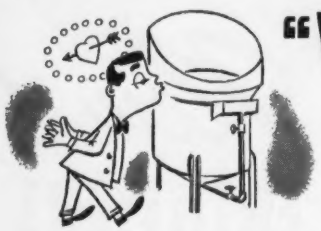
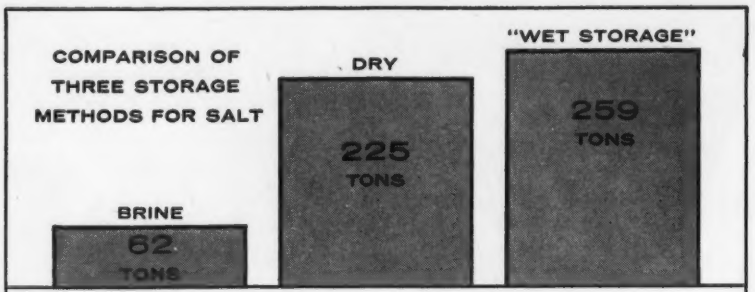
When inquiring check 4829 opposite last page

Using Salt Efficiently

by **INTERNATIONAL SALT COMPANY, INC.**—America's largest producer of salt



"Wet Storage"—an Economical Way to Store Rock Salt



HERE'S PROOF OF "WET-STORAGE" EFFICIENCY. Columns show amount of salt which can be stored in a tank 20' deep and 20' in diameter—by the three different methods. "Wet Storage" is obviously the best method, makes full use of available space.

A problem frequently encountered by salt-using companies is how to make the best use of available tank space for rock-salt storage. There are three basic ways to store salt in tanks: in brine form, in dry form, and in "wetted" form (dry salt stored under covering brine). Each method has certain advantages.

Salt stored in the form of fully saturated brine offers the important advantage of convenience: the brine can be pumped to points of use in the plant, eliminating salt-handling expense. However, the amount of salt which can be stored in this way is relatively small, because each cubic foot of brine contains only about 19¾ lbs. of salt in dissolved form.

Salt stored in dry form makes far better use of available tank space: each cubic foot contains an average of 72 lbs. of rock salt—about 3.6 times the amount which can be stored as brine. However, moving dry salt to points of use is time-consuming, inconvenient, and expensive. And dry-salt measurement is not as exact, or as easy, as measurement of fully saturated brine.

To get the benefits of fully saturated brine, along with the space-saving storage of dry salt, many salt-using companies are now using the tank-storage method known as "Wet Storage." This method—which actually combines features of dry storage and brine storage—offers these advantages:

1. Any given tank can store *more* salt than is possible when either dry salt or saturated brine is stored by itself.

2. There is a constantly available supply of fully saturated brine for every plant need.

3. Much less handling of rock salt is required. There are fewer salt deliveries, fewer brine-making problems.

How "Wet Storage" works. When a tank is filled with dry rock salt, almost half the storage space is actually "empty," because the salt crystals do not pack solidly together. But when the voids between the crystals are occupied by fully saturated brine, additional amounts of salt can be stored. This is because fully saturated brine itself contains 2.65 lbs. of salt per gallon. Thus, with salt stored both "wet" and in brine form in the *same* tank, maximum space is used for salt storage.

For example: in a circular tank 20 ft. in diameter, and 20 ft. in storage depth, the following amounts of salt can be stored, using the system of wet storage:

In "wetted" form the tank will hold about 231 tons of rock salt. In addition, there will be about 28 tons of salt dissolved in the covering brine. Total salt contents of the tank: 259 tons. Compare this with the other two salt-storage methods: The same tank will hold only 62 tons of salt dissolved in brine and about 225 tons in dry form.

Lixator best example of "Wet Storage" principle. Storing salt under covering brine is the basic operating principle of International's exclusive Lixate Brine-Making Process. In the Lixator, dry rock salt and fully saturated brine are combined, making fullest use of available storage space—and, at the same time, providing pure, crystal-clear brine for immediate use when and where it's needed.

In the Lixator (which is filled with rock salt), water is admitted at the top. This water dissolves some of the rock salt, to make fully saturated brine. This brine then fills the voids between the remaining salt crystals. As brine is drawn off, it is completely filtered by the salt crystals in the bottom portion of the Lixator. More rock salt is then automatically fed into the Lixator from the storage supply, and more brine is made to occupy the empty spaces.

Today, International offers many types of Lixators—all based on the principle of "Wet Storage." There are Storage Lixators, Silo Lixators, Sterling Model Lixators—in numerous designs to suit any plant layout.

TECHNICAL SERVICE WITH YOUR SALT

Through skilled and experienced "Salt Specialists," International can help you get greater efficiency and economy from the salt you use. International produces both Sterling Evaporated and Sterling Rock Salt in all types and sizes. And we also make automatic dissolvers in metal or plastic for both kinds of salt. So we can recommend the type and size of salt most perfectly suited to your needs.

If you'd like the assistance of an International "Salt Specialist" on any problem concerning salt or brine—or further information on "Wet Storage"—just contact your nearest International sales office.

International Salt Co., Scranton, Pa.

Sales Offices: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N. Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa.; Pittsburgh, Pa.; and Richmond, Va.

FOR INDUSTRY, FARM, AND THE HOME—
STERLING SALT
PRODUCT OF INTERNATIONAL SALT CO., INC.

For more information on product at left, specify 4830 see information request blank opposite last page.

Torula Yeast

(*Continued from page 48*)

In Dr. Paul Pavcek's library, J. M. Holderby (left) explains why Torula should be an ingredient in food products to E. W. Nordlinger assistant editor. Mr. Holderby has been working with Torula for more than 20 years. Dr. Pavcek has been secretary of the Food and Nutrition Board of the National Research Council, associated with the US Army Technical Intelligence Group investigating nutritive yeasts

food mixes.

2. It is accepted by both patients and healthy individuals of all age groups.

3. Has inviting taste when Torula is added in judicious quantities to foods requiring supplementation.

4. Undernourished children show increased appetite, food intake, and weight after addition of Torula to their foods.

(Details of research and sample quantities of Torula are available from Lake States Yeast Corp., Dept. FP, Rhinelander, Wis. . . . or for more information check 4832 on form opposite last page.)

ALGIN CORPORATION OF AMERICA

Marine Colloids

CARRAGEENATES

Gelcarin® Viscarin®

Caralak® Nutricol®

ALGINATES

Sodium Alginate Potassium Alginate

Calcium Alginate Alginic Acid

"The ingredients you use **BY THE PINCH** to make better products **BY THE POUND"**

For example:

1 ounce of Gelcarin produces permanent cocoa particle suspension in 125 quarts of chocolate milk.

1/200th of 1 per cent of Gelcarin in ice cream prevents whey separation and ice crystal formation, improves texture and melt-down control.

2.9 grams of Nutricol-200 added to 13 ounces of evaporated milk, hand-whipped and frozen in the family refrigerator, makes ½ gallon of ice cream.

These are some of the things our materials are doing in the food industry today — very economically in small amounts that go a long way.

We also know that these pure marine colloids possess unique characteristics that can cut costs, improve present food products, and even create new products.

Their outstanding effectiveness as bodying, stabilizing, suspending, and gelling agents has become increasingly recognized, and has made them a *must* in many food uses. Less well known is their astonishing versatility — which keeps research departments humming.

Let us work with you . . . and explore with you the possibilities these colloids hold for helping you with an idea you may have for a desired improvement in an existing product, or for the development of a new product.

Write us. Our technical department is waiting to be of service to you.

ALGIN CORPORATION OF AMERICA

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nadian Sales Representative — Charles Albert Smith Ltd. 6 Eastern Ave., Toronto 8 • 8307 Royden Road, Montreal 9

When inquiring check 4831 opposite last page

NATURAL ENZYMES

for food processing

Rohm & Haas commercial enzymes are all natural products . . . and among the most effective aids in food processing.

They are easy to use and are well suited to the mild processing conditions common to the food industry. In service they provide many benefits. For example, they clarify fruit juices, tenderize meats, aid in the production of pre-cooked breakfast cereals, improve the texture of bread, and reduce the viscosity of chocolate sirups.

Rohm & Haas enzymes catalyze specific reactions; unwanted by-products are not formed. And little enzyme goes a long way toward increased production efficiency and greater consumer sales appeal.

Write to Department SP outlining your food processing problem.

A **PECTINASE:** fruit juices, concentrates, wines

B **DIASTASE:** bread, cereal-derived products, corn sirup

C **PROTEASE:** meat, fish, beer

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

When inquiring check 4833 opposite last page

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FOR

"PRODUCTS WITH A PURPOSE"

. . . whether for a new product . . . an improved product . . . or in the development of a theory . . . we invite you to check any or all of these items for specific information on how they can be utilized to your advantage.

- ☐ Entrapped Powdered Flavors
- ☐ Butter Flavor Specialties
- ☐ Certified Food Colors
- ☐ Imitation Chocolate Flavors
- ☐ Coffee Flavor Specialties
- ☐ Concentrated Citrus Oils
- ☐ Coumarin Replacements
- ☐ True Fruit Flavors
- ☐ Imitation Fruit Flavors
- ☐ Maple Flavor Specialties
- ☐ Spicearomes
- ☐ Natural & Imitation Spice Oils
- ☐ Pure Vanilla Concentrates
- ☐ Imitation Vanilla Concentrates
- ☐ Worcestershire & other Sauce Bases

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When inquiring check 4834 opposite last page

food ingredients

Sesame oil has 83% Unsaturated fats, Natural Antioxidant

The following commentary received from one of FOOD PROCESSING'S readers is deemed of special interest at this time. See also two major articles on fats in foods this issue on pages 21 and 24

"I would like to offer the following opinion regarding the views you have been publishing (Ed's note: — Views of 18 authorities now available in reprint form . . . see announcement which follows this article.) on saturated *versus* unsaturated fats in the diet.

Although it wouldn't be fair to say that all of the conclusive evidence has been collected, there certainly seems to be reason for the food industry to be providing the consuming public with more fats with higher percentages of unsaturated fatty acids. This is the direct opposite from the situation now.

"Possibilities for the food industry finding such products have only a few bright spots at the moment. The most important of these is sesame oil. It has a high percentage of unsaturated fats (83%) with a high iodine value. It, of course, is an oil. What makes it unique among vegetable oils is its extremely long keeping qualities. This is due to presence of a natural antioxidant (sesamol).

Well known to Orientals

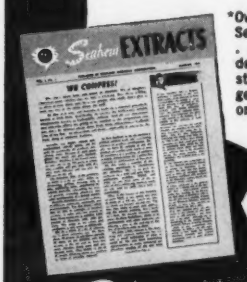
"Sesame oil is the basic oil for a large proportion of the peoples of some of the Oriental and Near East countries, as well as Central America. One-third of the population of India uses virtually no other fat than sesame oil. Perhaps a study should be made among these people for the incidence of death from coronary thrombosis.

"The important point is that sesame is now an American crop, having been grown in Texas for the past several years. It bids fair to become a very important crop, and the

Seakem "Colloids Out of the Sea"*

unique...

both in their reactivity with proteins and their ability to work well "in combination" with other colloidal materials



*Over 20 distinct types of SeaKem Stabilizers are available . . . each one a highly refined derivative of Irish Moss and standardized for a particular gelling, thickening, suspending or other function.

Ask to be put on our mailing list to receive SeaKem EXTRACTS — the exciting house organ that "tells all" about SeaKem "Colloids Out of the Sea"

Any special application problems? Write today!

Seaplant CHEMICAL CORPORATION

63 David Street, New Bedford, Mass.

When inquiring check 4835 opposite last page

Do you know about

SHEFTENES

as food ingredients?

The SHEFTENE family of milk proteins is versatile, functional, and economical.

SHEFTENE Sodium Caseinate is profitably being used by meat processors, bakers, ice cream manufacturers, dietetic and low-calorie food processors. As *binding, emulsifying* or *stabilizing agents,* SHEFTENE Sodium Caseinate has improved their mixing operations. Improved their products too! Perhaps this member of the SHEFTENE family can help you.

There are many SHEFTENE milk proteins. Perhaps one of these . . . SHEFTENE 60 milk protein concentrate, SHEFTENE High Nitrogen Casein, SHEFTENE Whipping Compound . . . may help you.

Send for technical information and sample today.

SHEFFIELD CHEMICAL

NORWICH, NEW YORK

Branch Office, 1267 Sixth Ave., New York 19, N.Y.

When inquiring check 4836 opposite last page

oil will be available domestically in the near future at perhaps prices even under those current for cottonseed, peanut, and soybean oils.

"Sesame oil is unique for flavor and particularly for keeping qualities needing no hydrogenation or reduction in its unsaturation to make it store well. Additional specifications as well as growing characteristics of the sesame plant are contained in several recently published technical articles. The product is grown and refined in Texas by the American Sesame Products Co."

ELMER F. GLABE
President
Food Technology, Inc.
5903 Northwest Highway
Chicago 31, Ill.

Views of 18 authorities

Terse commentaries of eighteen authorities on recent developments in fats have been combined into a 12-page reprint (convenient size of 8½ by 11"). Their views first appeared in the January, March, and April issues of FOOD PROCESSING. To secure one of these reprints send 50c to The Editor, FOOD PROCESSING, 111 East Delaware Place, Chicago 11, Illinois. Quantity prices on request.

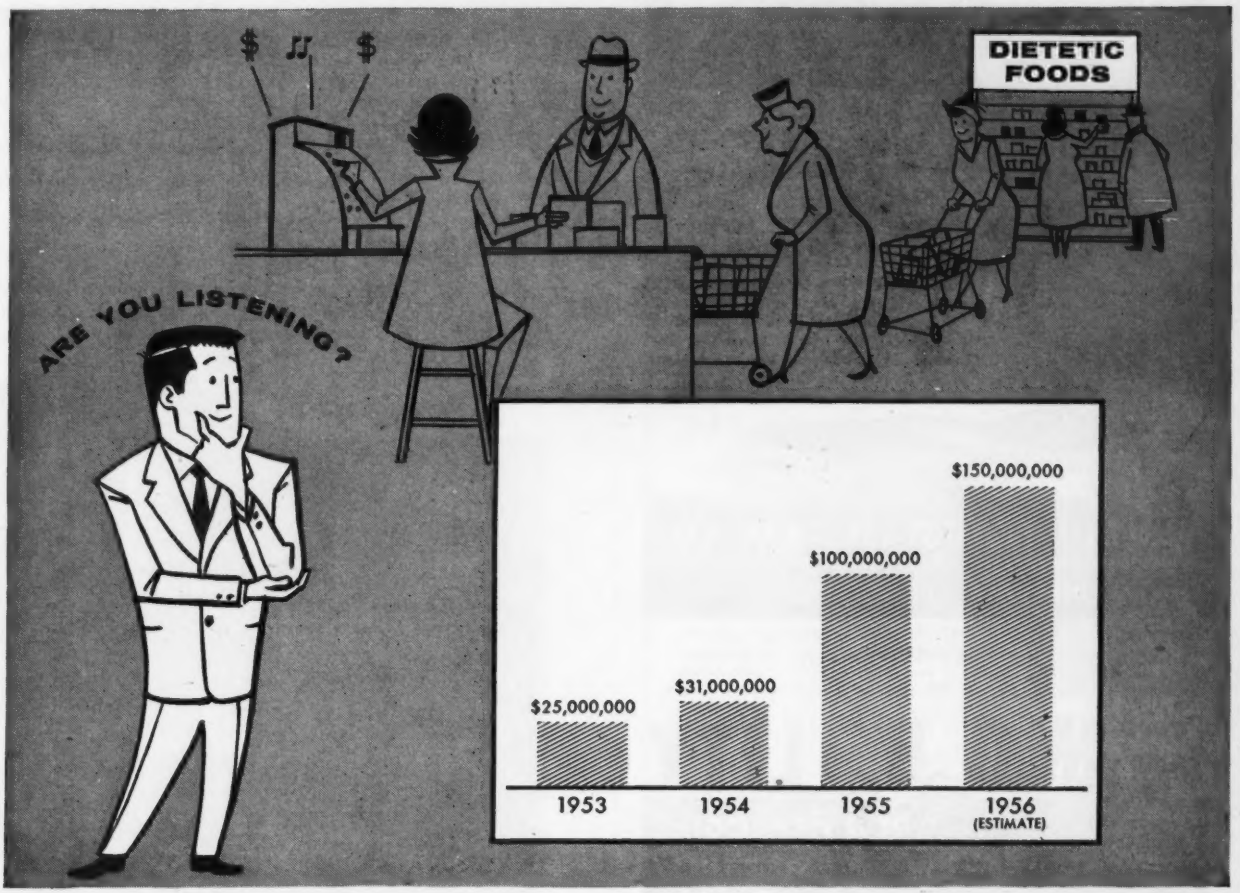
Recommends flavor amounts for various foods

Four-page table recommending amounts of natural and imitation liquid flavors to add to various classes of foods is featured in price list. A second list with similar table gives prices of 45 dry flavors.

Bulletins available from Polak's Frutal Works, Dept. FP, Middletown. N.Y. Check 4837 opposite last page.

Dietetic Foods-

a $150 million business and still growing



Cylan® —Du Pont's non-caloric sweetener
CALCIUM & SODIUM CYCLAMATE **can help you get a share of this expanding market**

Diet-conscious consumers are spending millions for low-calorie foods and beverages. And they're ready to buy an even wider variety of diet-styled products that have a delightfully natural taste. Formulating with Du Pont "Cylan" will give your dietetic products just what your customers are looking for and give you a profitable share of a market that is growing larger every shopping day.

"Cylan" gives dietetic foods and beverages a deliciously sweet taste, without adding calories. It is stable, economical and easy to use.

Join the processors who have found that their dietetic products sweetened with "Cylan" have the elegant taste that builds popularity for their brands.

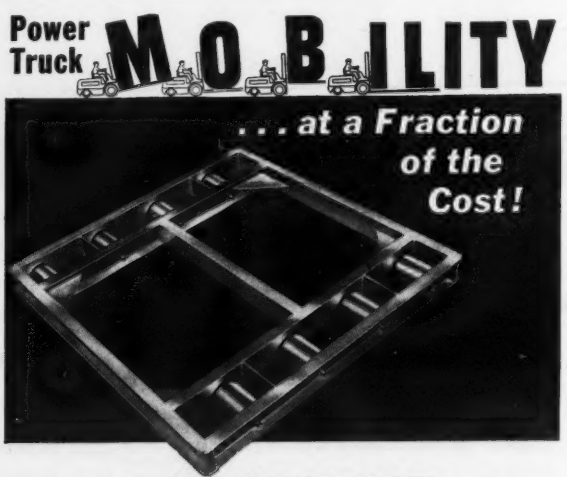
DU PONT
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.) FP-77
Grasselli Chemicals Dept., Room 4161-D, Wilmington 98, Del.
I am interested in ☐"Cylan" Calcium ☐"Cylan" Sodium
Please send me: ☐ An inspection sample ☐ A working sample
☐ Information for making dietetic_____
Name_____
Firm_____
Position_____
Address_____
City_____Zone____State_____

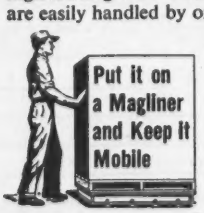
When inquiring check 4838 opposite last page

LIGHT
BUT SO STRONG!
TOTELINE
FIBERGLASS
TRAYS
For Drying:
CHEMICALS
PHARMACEUTICALS
ANTIBIOTICS
They're feather-light, but they're durable and sturdy as any trays you've ever used! What's more, the large inside corner radii makes them very easy to clean. And, because fiberglass does not absorb heat, the materials dry faster in Toteline trays. Many sizes available. Write
TOTELINE
Wherever
materials
are handled
MOLDED FIBERGLASS TRAY CO.
World's largest producer of Fiberglass reinforced resin Trays, Tote Boxes
LINESVILLE, PENNSYLVANIA

When inquiring check 4839 opposite last page



MAGLINER MAGNESIUM PALLET DOLLIES free-up your power equipment for the big jobs and longer hauls. Put a Magliner under every pallet load and its ready to roll . . . quickly, easily, *economically*. A small investment that pays big dividends, Magliners are the practical solution to loading bottlenecks . . . high loading costs. Made of magnesium, Magliner pallet dollies are easily handled by one man . . . carry loads up to 4,000 lbs., safely, smoothly on large 3¼" rollers. Tough, rugged, welded magnesium construction. Dependable, long-life service! 14 standard models and sizes.



Write for Bulletin P8-1

Magline Inc. • P.O. Box 257 • Pinconning, Mich.

Canadian Factory—Magline of Canada Ltd., Renfrew, Ont.

When inquiring check 4840 opposite last page

Pipeline that spans street

HALVES COFFEE BEAN HA

Pipeline spans street, climbs side of process building to move green coffee from warehouse and discharge it into receiver on roof

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HANDLING COSTS

Eliminates warehouse to plant trucking . . . frees former storage space for new equipment

E. RASMUSSEN, Plant Engineer,
J. F. G. Coffee Company, Knoxville, Tenn.
as reported by **FP Staff**

When it's difficult to go straight across or around, the answer often lies in going up and over. That's just what JFG Coffee Co. did to improve efficiency in handling coffee between warehouse and process buildings situated on opposite sides of the street. The pipeline seen in the photo (at left) spans a distance of 150' over street and sidewalks at two-story height and then goes up the side of the 5-story process building to a receiver on the roof.

Difficulties of the old method, using a trackless train, are no more. Multiple handling of bags to load individual cars has been eliminated. Time is no longer lost moving cars, one at a time, to fifth floor of process building on elevator.

Installation of the pneumatic conveying system made possible a more efficient arrangement of blending steps. Previously, blenders were located in process building. Supplies of bagged coffee were stacked close by, taking up an excessive amount of space. Blenders are now located in warehouse. Bags are first picked up from palletized loads and dumped into cleaning hopper, then blended and moved to a 10,000 lb storage bin. A remotely operated cut-off gate regulates the flow of beans from bin into hopper. From receiver on roof of process building beans are discharged into a screw conveyor for distribution to bins which serve roasters. Pressure for the system is provided by a positive displacement blower.

Savings in handling costs are estimated at 50%, and the whole operation is much cleaner, faster and more efficient. More than 75% of the space formerly required for blenders and coffee storage has been released for installation of new production machinery. This enclosed system also prevents waste and contamination.

("Airstream" conveying systems are built by the Dracco Corp., Dept. FP, Harvard Ave. and E. 116th St., Cleveland 5, Ohio. Check 4841 on form opp. last page.)

E. Rasmussen, plant engineer, JFG Coffee Co., Knoxville, Tenn. inspects intake hopper in the warehouse from which coffee beans enter conveyor

Beans are discharged from receiver on roof of process building into screw conveyor for distribution to bins which serve coffee roasters

PALMER-SHILE
Materials
HANDLING EQUIPMENT
Engineered and Built to meet your needs

CONTROLLED PRECISION DUMPING or POURING
CONSULT P-S FOR THE BEST DRUM and BARREL TILT
Especially ideal for handling chemicals, solvents, powders, etc. Unit for handling carboys also available. Equipped with two safety type locking devices and all steel, welded yoke. Turns 360° through worm drive. Hand-operated chain drive or 12" O.D. hand wheel.
Item B-731 $217.50

LOADING and UNLOADING TRUCKS
CONSULT P-S FOR THE BEST DRUM and BARREL SLING
Item B-205 $20.15
Handles drums, barrels, kegs that have a lip. Excellent for handling draining of drums. Heavy welded chain and forged grab hooks. Weight approx. 8½ lbs.

CONVENIENT, SAFE HANDLING of LIQUIDS with
CONSULT P-S FOR THE BEST Combination TRUCK and DRAIN RACK loads automatically
DETACHABLE HANDLES
Item NS 506 DH (detachable handles) $61.80
Item NS 506 (handles welded to frame) $57.35
This dual purpose truck can be used to move barrels or drums and also serve as a drain rack. Available in two styles—handles welded to frame or with detachable handles that can be pulled out to conserve floor space. One set of handles can serve any number of trucks. Sturdy welded construction. Free-rolling 8" roller bearing wheels. Weight approximately 90 lbs.

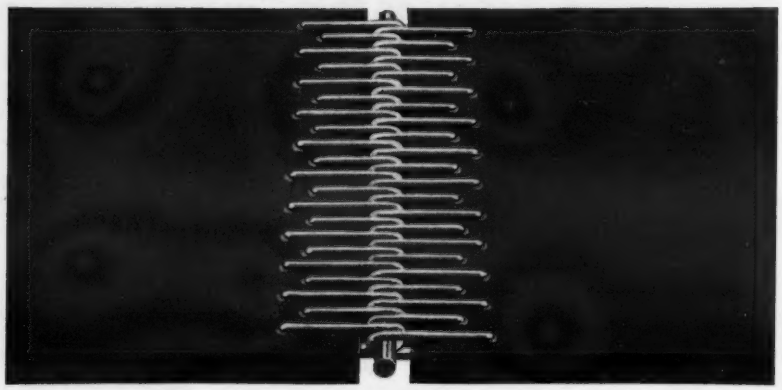
DESIGNED AND MANUFACTURED BY
Palmer-Shile Co.
16045 FULLERTON AVE DETROIT 27 MICH

BOSTON, Mass., CO 6-0570 • BURLINGAME, Calif., DI 2-0823 • CHICAGO, Ill., AUstin 7-8399 • CLEVELAND, Ohio, SU 1-3235 • DENVER, Colo., AL 5-3984 • FLINT, Mich., CE 8-6881 • FORT WAYNE, Ind., KE 5408 • INDIANAPOLIS, Ind., ME 5-2587 • LOS ANGELES, Calif., RA 3-3733 • MILWAUKEE, Wis., BRoadway 1-9860 • ST. LOUIS, Mo., PR 1-1474 • WHITE PLAINS, N. Y., White Plains 6-1384

When inquiring check 4842 opposite last page

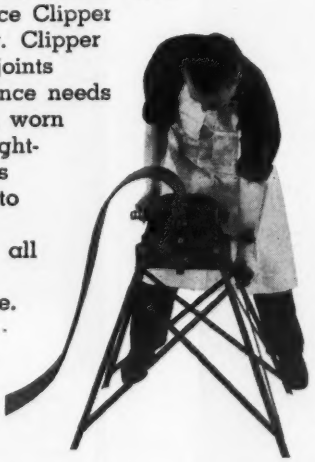
Clipper

HOOKS and LACERS save money 2 ways



Make replacement less frequent — speed replacement when needed

Clipper machine-lacing installs Clipper Belt Hooks under great pressure quickly and easily. Once Clipper belt hooks are inserted, they're in to stay. Clipper machine-laced joints outlast other belt joints several times over — slashing maintenance needs and unproductive downtime. And when worn belts must be replaced or slack belts tightened, the Clipper machine method is faster than other methods. Exerting up to 45,000 pounds pressure, Clipper Belt Lacers lace belts up to 12 inches wide all in one operation, again slashing maintenance time and unproductive downtime.



FOR MORE INFORMATION

Detailed product information and case history examples of Clipper machine-lacing benefits are contained in Bulletin No. 157. Send for your free copy today.

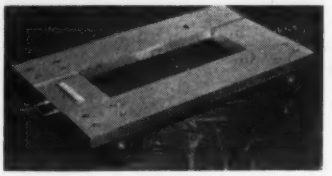
Ask your Industrial Distributor for Clipper Products

Clipper BELT LACER COMPANY

972 Front Ave., N. W. Grand Rapids 2, Michigan

When inquiring check 4843 opposite last page

Dolly weighs 8 lb, carries 1200 lb



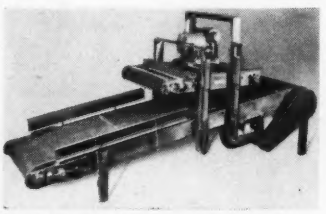
Dolly made of magnesium measures 18x36", weighs 8 lb, can hold 1200-lb load depending on type of caster. Photo shows dolly with Rapistan solid rubber swivel casters.

(Magnesium Dolly is made by Brooks & Perkins, Dept. FP, 1950 W. Fort St., Detroit 16, Mich. . . . or for more information check 4844 on form opposite last page.)

Power drive for both flattener decks assures fast performance

Removing air, compressing bag aids with easy handling, stable stacking

A flattener unit with both upper and lower decks power driven quickly removes air and compresses bags to assist easy, stable stacking. Amount



Amount of compression regulated by bag flattener's upper deck tension control

of compression is governed by adjustment of upper deck spring tension control. Standard units are available in following dimensions: 16, 20, and 24" widths; 8, 10, and 12' lengths.

(Bag flatteners are available from Sage Equipment Co., Dept. FP, 30 Essex St., Buffalo 13, N. Y. . . . or check 4845 on form opposite last page.)

Look No Further... For QUALITY

Specify DARNELL

CASTERS AND WHEELS

CHECK THESE ADVANTAGES

RUBBER TREADS . . . a wide choice of treads suited to all types of floors, including Darnelloprene oil, water and chemical-resistant treads, make Darnell Casters and Wheels highly adapted to rough usage.

RUST-PROOFED . . . by zinc plating, Darnell Casters give longer, care-free life wherever water, steam and corroding chemicals are freely used.

LUBRICATION . . . all swivel and wheel bearings are factory packed with a high quality grease that "stands up" under attack by heat and water. Zerk fittings are provided for quick grease-gun lubrication.

STRING GUARDS . . . Even though string and ravelings may wind around the hub, these string guards insure easy rolling at all times.

The full story is yours for the asking—

There's a Dealer Near You
Consult the Yellow Pages

DARNELL CORPORATION, LTD.
DOWNEY (LOS ANGELES COUNTY) CALIFORNIA
60 WALKER STREET, NEW YORK 13, NEW YORK
36 NORTH CLINTON STREET, CHICAGO 6, ILLINOIS

When inquiring check 4846 opposite last page

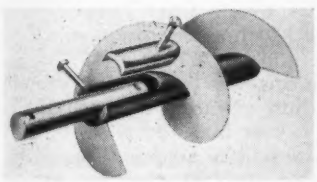
Catalogs fork trucks and 24 attachments

Fork-lift trucks, straddle carriers, powered hand trucks, and towing tractors are described in a 16-page illustrated catalog. In a special section, 24 attachments for fork trucks are pictured and a chart indicates which attachments are available for each truck.

Special condensed catalog is issued by Clark Equipment Co., Dept. FP, Battle Creek, Mich. When inquiring specify 4847 on the convenient form opposite last page.

Equipment added to line of screw conveyor components

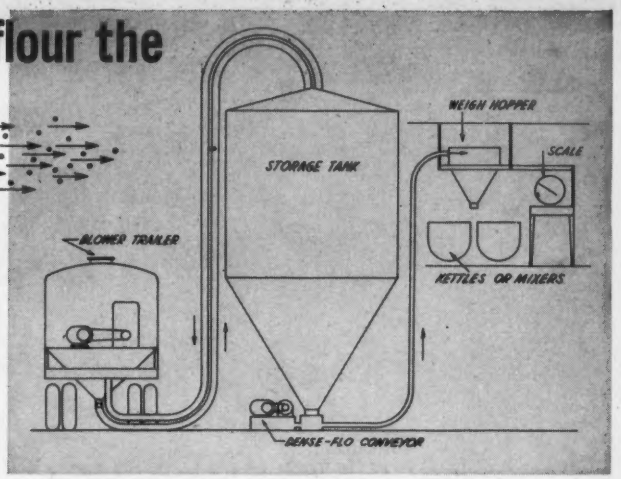
Comprehensive line of screw conveyor components has been augmented by new related ball bearing equipment. These are described and illustrated in a 6-page folder.



Designed to fit new or existing screw conveyors, the ease of installation and maintenance is emphasized by: quick-change features of "quick-link" conveyor screw (illustrated); ball and roller bearing counter shaft ends. The "quick-link" conveyor screw permits quick removal of any conveyor screw section or hanger without disturbing other components. Screws are available in both helicoid and sectional flight types and are interchangeable with existing conveyor screws.

(Folder No. 2849 — Additional Components for Screw Conveyors, has been prepared by Link-Belt Co., Dept. FP, Prudential Plaza, Chicago 1, Ill. When inquiring specify 4848 on the convenient form opposite last page.)

Bulk handling of sugar or flour the DENSE-FLO way saves 25¢ to 50¢ per sack



Refiners and millers deliver in bulk to your storage tank at prices 15-25c below sacked sugar or flour, and you save another 10-25c in sack handling. You reduce sanitation costs, storage space requirements and breakage.

DENSE-FLO in-plant systems convey 100 to 250 lbs. of material per minute pneumatically thru lightweight, small diameter pipelines. Can be installed without structural changes in your present buildings. Systems are extremely flexible, easily automated. You save on maintenance because no bucket, belt or screw conveyors are needed. First cost is usually lower, too.

If you handle 15,000 sacks yearly, a DENSE-FLO system—including storage tanks, dump bins, weigh hoppers, controls—will pay for itself out of savings.

We pioneered pneumatic handling of sugar on the West Coast, have installed DENSE-FLO systems for American Sugar, C. & H., Holly, National Sugar and Spreckels. We are equipped to handle your entire job from design of system thru installation. Write today for bulletins describing typical uses.

Dealer inquiries invited.

ALBERT AIR CONVEYOR CORP.

600 - 16th St., Oakland 12, Calif. • Phone: TEmplebar 6-1760
New York: Robert Dollar Co., 1 Broadway • BOwling Gr. 9-6938

When inquiring check 4849 opposite last page

Rugged...Dependable...Practical

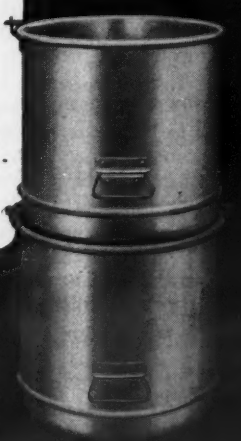
Commercial Aluminum Ware FOR HANDLING BULK FOODS!

Ease of handling, storing and cleaning . . . maximum utensil life! Get them all with Commercial aluminum food-handling equipment. Designed to meet the practical requirements of meat and food processors, Commercial utensils are built of extra heavy aluminum with double strength at critical wear points . . . rounded corners and closed beaded edges for maximum sanitation . . . large, roomy handles for quick, easy moving and stacking. Bright aluminum finish is acid, stain, abrasion and corrosion resistant for dependable, long-life service. You get long run economy *plus* lower initial cost when you buy Commercial aluminum food-handling equipment!

Write today for information and prices.

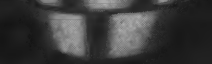
HEAVY DUTY STOCK POT
For extra heavy usage. Heavy steel handles. Available with faucet and strainer. 12 sizes, up to 100 qt. capacity.

STACKING INGREDIENT PAILS
Stack conveniently for efficient storage. Long wearing service. Three sizes, up to 36 qt. capacity.



STACKING BAIN MARIES
Excellent for replacement of crocks. Save valuable storage space. Alumilite finish. Three sizes, up to 20 qt. capacity.

UTILITY/DISHPAN
Alumilite finish Sturdy, versatile, practical. Five sizes, up to 60 qt. capacity.



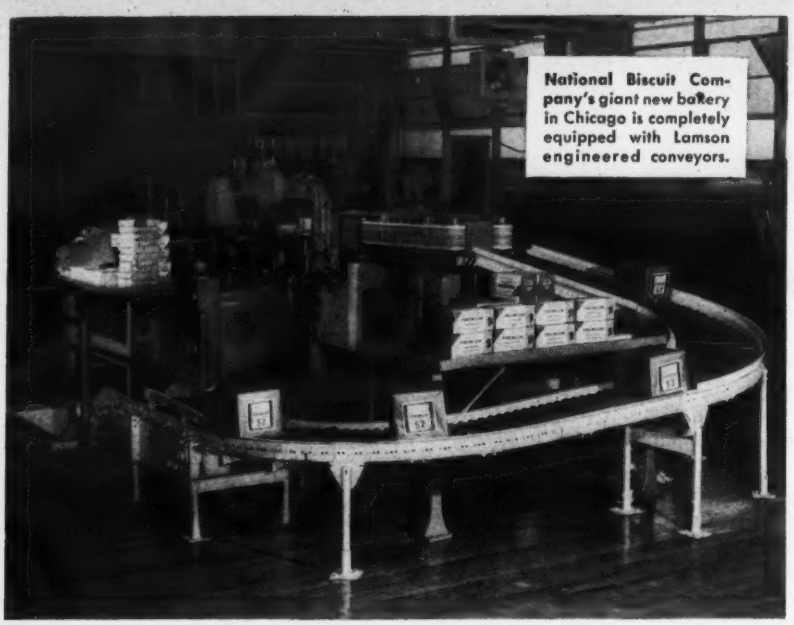
MEAT TRIM TUBS
Built to take it. Ideal for meat trimmings, storage, etc. Two sizes 20 and 41 qt. capacity.

DOLLY
For handling extra heavy tubs and containers. Available in three sizes, 21" diameter illustrated.

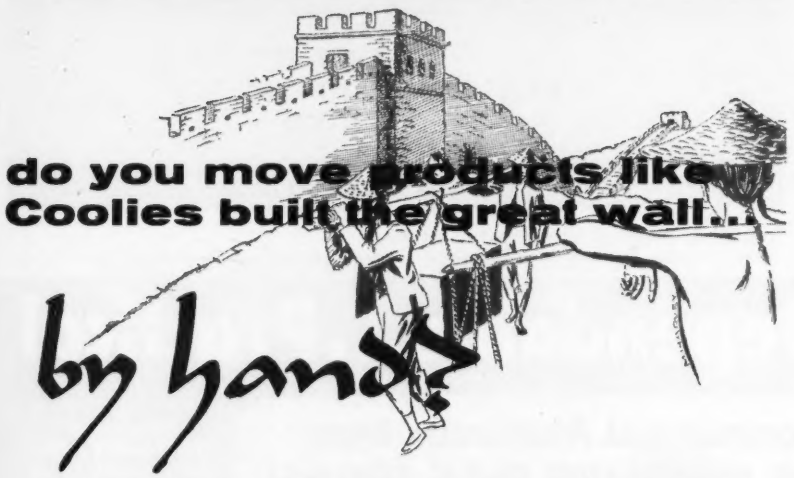
Also Available: LARGE MIXING BOWLS—Heavy steel handles. Alumilite finish. Five sizes, up to 80 qt. capacity. PAILS—Versatile, rugged, practical. 4 sizes, up to 22 qt. capacity.

HARLOW C. STAHL COMPANY, 1373 E. JEFFERSON AVE., DETROIT 7, MICH.

When inquiring check 4850 opposite last page



National Biscuit Company's giant new bakery in Chicago is completely equipped with Lamson engineered conveyors.



do you move products like Coolies built the great wall...

by hand?

Systematic work on the Great Wall of China began in 228 B.C., and was finally completed in 1644 A.D. Reaching a length of about 1400 miles, it is a testament to the back-breaking work of literally hundreds of thousands of Chinese. Today, you can't afford to move your products "Coolie-style."

In the package conveyor field, Lamson offers the broadest line. Nationally known companies depend on Lamson to engineer and install belt, gravity and live roll conveyors; continuous trolley systems; reciprocating vertical conveyors of all types; continuous combing verticals; and a broad line of automatic and semi-automatic pallet loaders.

Talk over your conveying problems with a Lamson engineer. He'll show you ways to cut costs and meet production schedules.

LAMSON

FOR FURTHER INFORMATION, Clip to Your Letterhead

☐ Have an engineer call me for an appointment.

Send me these bulletins:

☐ "Conveyor Facts"
☐ 28-page Roller Gravity Bulletin
☐ "Utilize the Air Rights"
☐ "Automatic Pallet Loader"

254

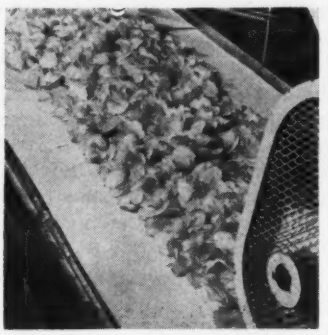
LAMSON CORPORATION
254 Lamson St., Syracuse 1, N. Y.
Plants in Syracuse and San Francisco
Offices in Principal Cities

When inquiring check 4851 opposite last page

Faster conveying boosts belt wear

Conveying of potato chips an example

Processing speed-up calls for constant improvement in handling equipment on the part of suppliers. Belts used in potato chip production are



Hycar cover of belts resists oily hot chips

a good example. During the past twenty years, chip processing speeds have spiraled from 200 lb/hr to 1000 lb.

New belt fabricating methods and better coating and impregnating techniques have increased belt life. Also, laminated construction has provided belts that could be used over smaller pulleys.

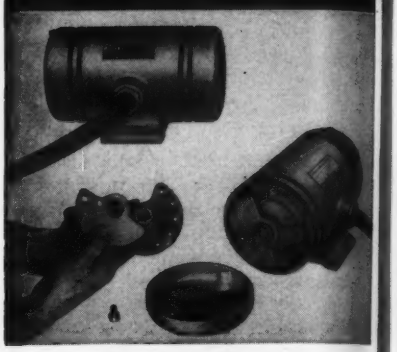
More recently, use of Hycar, a rubber-like compound, for impregnating and coating has resulted in belts with a glass-like surface that does not pick up grease or food particles and resists any tendency to soften under contact with hot, oily, salty chips.

(Hycar coated conveyor belts are made by Victor Balata & Textile Belting Co., Dept. FP, 53 Park Place, New York 7, N.Y. . . . or check 4852 on form opposite last page.)

HAVE YOU NOTICED?

FOOD PROCESSING is now 'executive size'. Turn to page 6 for the full story on this improvement on an earlier original design.

NEW ADJUSTABLE ELECTRIC VIBRATOR



NO WEIGHT CHANGING

A brand new silent electric vibrator that lets you vary the force of vibration without complicated weight changes, The Cleveland Vibrator Company now offers adjustable cams, permitting a change of vibrator force over a 3 to 1 range in a matter of seconds.

With this new bin vibrator you can adjust vibration to exactly fit your bins and type of material you are handling. No problem when you use a bin for different materials; just change the weights a notch. It's absolutely silent too.

Write for detailed information.

Air or Electric
Portable or Permanent
Silent or Standard

2818 Clinton Ave. • Cleveland 13, Ohio

When inquiring check 4853 opposite last page

Magcoa / Tobey aluminum Trucks

easiest to push and steer!

- Cut handling costs
- Non-toxic, odorless aluminum
- No painting or special finish required
- Entire truck is maintenance-free
- Easy-swivel, free-rolling casters
- Available in many styles and sizes

For full details use the coupon below.

MAGNESIUM COMPANY OF AMERICA TOBEY ALUMINUM DIV.
magcoa
East Chicago 5, Indiana
Representatives in principal cities

☐ Please send Magcoa/Tobey Data File

Name and Title_____
Company_____
Address_____
City-Zone-State_____

Copyright, 1957, Magnesium Company of America

When inquiring check 4854 opposite last page

Dumps 400 lb loads — 75 per hour

Features: Can be equipped as a multi-purpose machine with changeable skips for handling drums. barrels, boxes and bags.

Push button dumper

Description: Also available with any one skip for single purpose operation. Dumpers are made in mobile type to dump at any height from 2′ to 8′. Special stationary models are built to dump at any height required. Power is by ¼ hp motor (3 phase or single phase).

(Cesco Jr. dumpers are built by Essex Conveyors, Inc., Dept. FP, 165 Franklin Ave., Nutley 10, N. J. . . . or check 4855 on form opposite last page.)

"Just as I thought, . . . free-lancing!"

WIN IN THE BATTLE OF BRANDS

There are more than 150,000 brand names registered in the United States—competing for the customer's attention.

In this "battle of brands" brightly printed Gaylord Boxes are a vital link in the chain of visual impressions that pays off in sales.

This is true because Gaylord excels in printing. Gaylord has the specialized experience and equipment to make quality boxes do their selling best—with your brand name accurately expressed in eye-catching colors.

Put Gaylord Boxes on your selling team. Call your nearby Gaylord office.

Gaylord Boxes

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS
KRAFT PAPER AND SPECIALTIES
KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS
DIVISION OF CROWN ZELLERBACH CORPORATION

When inquiring check 4856 opposite last page

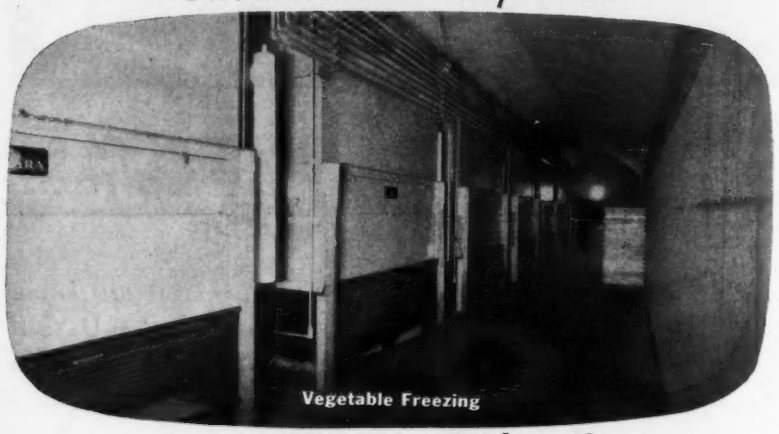
NIAGARA "NO FROST"

25 Years' Successful Experience

★ *Never any defrosting shutdown*

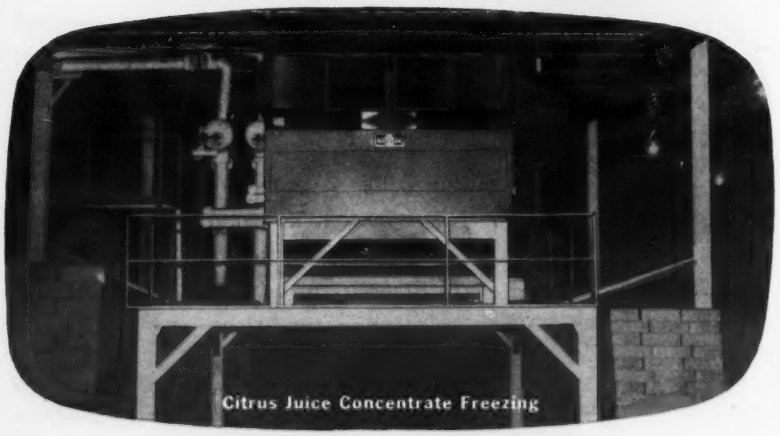
Fish Freezing

★ *Never a rise in temperature*



Vegetable Freezing

★ *Save Power... Reduce Costs*



Citrus Juice Concentrate Freezing

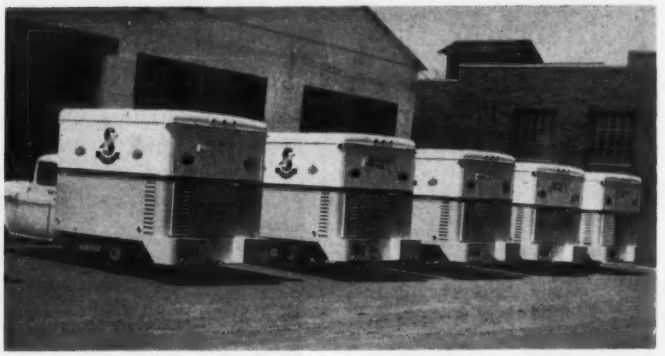
Write for Niagara Bulletin 105

NIAGARA BLOWER COMPANY

Dept. FP-7, 405 Lexington Ave. New York 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada

When inquiring check 4857 opposite last page



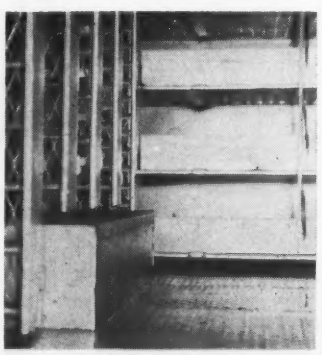
A few of the fleet of 30 air-conditioned trucks that deliver Mrs. Smith's pies

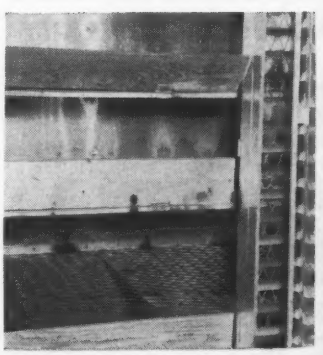
Truck temperature 55°—humidity 45% assure delivery of pies oven fresh

Thermostat controls motor-generator unit of refrigerator system

Nothing is too good for Mrs. Smith's pies in the way of travel accommodations, so they ride in trucks which are air-conditioned with humidity closely controlled. When pies are delivered they are flakier, crisper, with oven fresh flavor retained. Custard and cream pies particularly are handled to greater advantage. Photo shows some of the fleet of 30 trucks built for Mrs. Smith's Colonial Baking Co., Silver Spring, Md. Temperature is uniformily 55° and humidity 45%. When trucks are out on their routes, thermostat controls the motor-generator system. This is an extremely compact self-contained unit placed in left-hand rear corner of body.

After deliveries are made and trucks return to plant, they are checked and serviced and plugged into dockside electrical outlets. A switch simplifies going from motor-generator operation to direct electrical operation. As a precaution for salesman starting truck in





Views left and right show ventilated pie racks, grill-work shelves and armored floor

morning to move it to loading dock, a sign is placed on each steering wheel reading, "Have You Disconnected Your Unit?" This prevents driver starting up without disconnecting plug-in. Restaurant pies are carried on specially built ventilated pie-racks. All boxed items are carried on aluminum grill work shelves.

Body units of vans are steel, 83" wide, 72" high with single rear door 32" wide. They have all-aluminum interior lining and are insulated with glass wool.

(Bodies were furnished for mounting on Chevrolet chassis by Brightbill Body Works, Inc., Dept. FP, East Cumberland St. at 7th Ave., Lebanon, Pa. . . . or for more information reader may simply check 4858 opposite last page.)

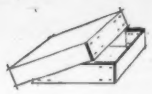
Bonded block method of car loading

A four-page manual describes in detail the bonded block method of loading rail freight cars. Canners have been asked to join in this program, designed to achieve merchandising of canned foods in near-perfect condition.

Two factors are stressed in securing good delivery of glassed and canned products: 1) good, tight-fitting containers, and 2) loading by bonded block method. Method is flexible and can be used in leading all rectangular containers in cars of different widths and lengths.

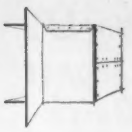
Principle of the method is to build up load in blocks, in which the containers are bonded together into units by reversing each layer. In stowing containers in car, they are pressed back into place firmly. When doorway is reached, all open space lengthwise in the car is taken up by proper fibreboard dunnage.

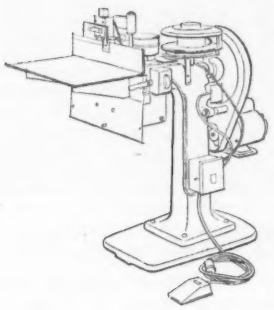
Bonded Block Loading manual is issued by National Institutional Wholesale Grocers Assn., Dept. FP, 3425 S. Kedzie Ave., Chicago 23, Ill. When inquiring specify 4859 on form opposite last page.



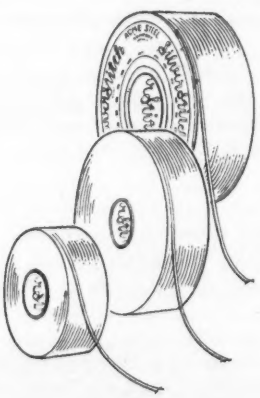
CLOSURE IDEA BULLETIN

For Users of Fibreboard Boxes



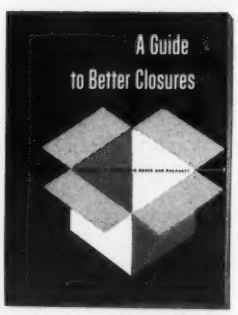


Acme Steel Model HOHT Silverstitcher closes both tops and bottoms of loaded full overlap boxes efficiently and securely. A penetrating power-driven clincher enters at the box edge behind both flaps, forms a secure stitch and retracts automatically. Model HOHT is particularly effective in closing long, narrow boxes economically. Model HOHT also fastens 5-panel folders and some double and triple slide boxes.



The gauge accuracy and smoothness of Acme Steel Silverstitch Stitching Wire prolongs machine life and precise level winding promotes smooth, high-speed feeding. Insure extra life and steady production for your stitching machines by ordering Acme Steel Stitching Wire in 10, 25, or 50-pound coils.

Arcuate Wire Stitching, an advanced method developed by Acme Steel, greatly increases the driving strength of stitches. Arcuate gives you trouble-free, continuous stitching ...with minimum machine adjustment...even under hard usage and sustained high-production operation. And Arcuate can be ordered on all new machines or obtained with a simple conversion kit for older stitchers.



Acme Steel recently published an informative 20-page handbook, "A Guide To Better Closures", which provides a ready source of box closure data. Send for your copy.

Call your Acme Idea Man on any problem in closing boxes. Call him at the nearest Acme Steel office, or write: Dept. FGW-77, Acme Steel Company, Chicago 27, Illinois.

ACME STEEL **WIRE STITCHING**

When inquiring check 4860 opposite last page

World's Largest Quick-Freezing Plant Finds

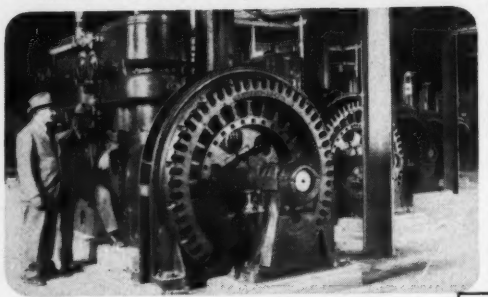
FRICK Refrigeration Highly Dependable

Seabrook Farms, near Bridgeton, N. J., have been using Frick refrigerating equipment exclusively since 1929. Today, Seabrook operates 22 Frick compressors. Of these, 12 are heavy-duty 4-cyl. machines, with 12-in. stroke. Total refrigeration horsepower is over 5000.

Belford Seabrook, vice president in charge of engineering, writes about the excellent service record made by these big machines, several of which are in continuous operation, day and night, most of the year:

"Figured on the original investment in these compressors, the annual cost of repair parts, including their installation, is averaging only 1 per cent." Other users have had Frick compressors in continuous operation for four to six years without even opening the machines!

If you want the last word in reliable refrigeration, specify Frick equipment, and accept nothing less.

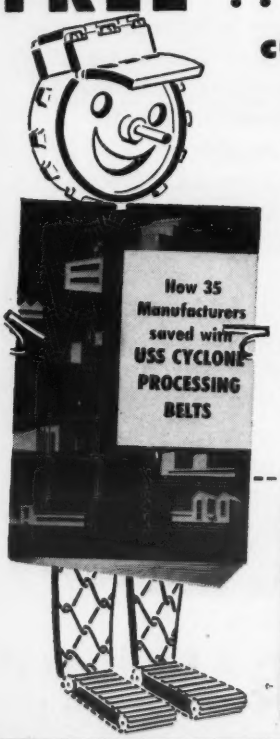


Belford Seabrook, Operating Vice President, checks the performance of the Frick compressors.

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA., U. S. A.

When inquiring check 4861 opposite last page

FREE . . . A NEW BOOKLET ON cutting production costs



Our new booklet, *"How 35 Manufacturers saved with USS Cyclone Processing Belts,"* contains 35 actual case histories of savings on production costs, materials, time, space, breakage and labor . . . through use of Cyclone Belts.

USS Cyclone Steel Processing Belts are available in many sizes, types and finishes. In plants all over the country they are paying for themselves again and again in higher production rates, reduced manual labor and increased efficiency. One or more of these 35 case histories are bound to show how you, too, can save with a Cyclone Belt. Be sure to mail the coupon for your free copy today.

CYCLONE FENCE DEPARTMENT
AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION
WAUKEGAN, ILLINOIS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

—MAIL THIS COUPON TODAY—

Cyclone Fence, Dept. K-77
Waukegan, Illinois

USS

Please send me your big, illustrated Belt Booklet. No charge or obligation.

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UNITED STATES STEEL

When inquiring check 4862 opposite last page

transportation

Wash tanks by spray, then insert valve to load liquid sugar

Trailer's cargo is never exposed to contamination

Easy loading, easy cleaning are just two of many design features of stainless steel tank trailers operated by California and Hawaiian Sugar Refining Corp. Inside of tanks has mirror finish, polished so that even weld lines can't be seen.

Trailer can be washed mechanically with a rotating sprayer going through the main manhole and other washing holes in tank. Loading is accomplished through a loading valve connected to a fitting on top of tank. This permits tank to be loaded without the liquid sugar ever becoming exposed to outside atmosphere.

(Liquid Sugar tank trailers are available from Fruehauf Trailer Co., Dept. FP, 10941 Harper Ave., Detroit, Mich. Check 4863 opp. last page.)

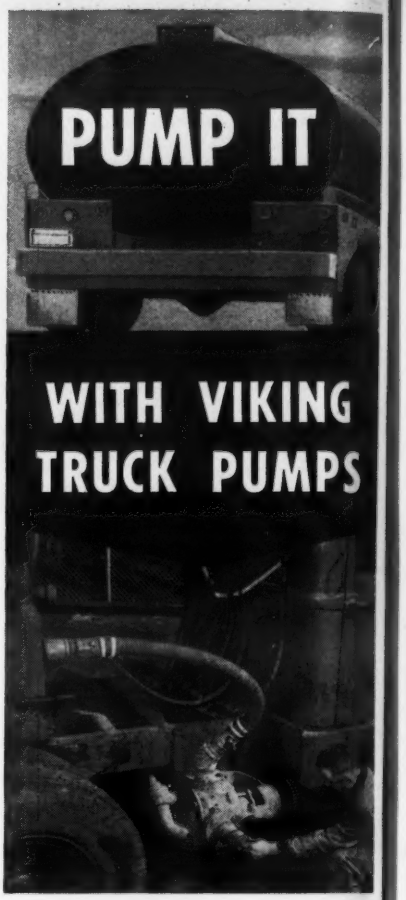
New aluminum trailers weigh 1700 lb less — cut road shock 75%

Air-ride running gear is featured on a new lightweight aluminum trailer. This suspension system is designed to eliminate 75% of the road shock normally transmitted to trailer body by conventional leaf spring gear. Another advantage is elimination of spring deflection, permitting a constant, lower floor level and increasing body-loading height.

These vehicles weigh 7920 lb compared to 9620 lb for conventional aluminum trailers of same size. Capacity is 2842 cu ft.

Major factors contributing to low weight are lighter running gear, light weight, high-strength aluminum flooring and aluminum slat lining replacing conventional ¼" fir plywood.

(Lightweight aluminum cargo trailers are built by Brown Trailers, Inc., Dept. FP, 6328 Utah St., Spokane, Wash. . . . or check 4864 opp. last page.)



. . . and SAVE valuable loading and unloading time

If you are transporting a liquid or semi-solid, you will save valuable time and money when you load and unload with a POSITIVE Viking truck pump.

Powered from the truck, through power take-off from the transmission, the Viking positive pump keeps the truckload on the move — not standing idle with slow gravity filling and emptying.

Equipped with integral Viking relief valve, the discharge line may be shut off without stopping pump.

Available in 35, 50, 90, 200 and 300 GPM sizes. Ask today for Catalog Gep and SP377 ep.

VIKING PUMP CO
Cedar Falls, Iowa, U.S.A.
In Canada, it's "ROTO-KING" pumps
SEE OUR CATALOG IN SWEETS PLANT ENGINEERS FILE

When inquiring check 4865 opposite last page

Thinner walls practical for refrigerated bodies

Efficient insulation cuts thickness to 30%

Closed cell structure of a foamed plastic insulation board slows heat pick-up so effectively it permits body wall thickness to be reduced drastically. Low conductivity

Foamed plastic insulation applied with adhesive

of only 0.24 at 70°F mean temperature, cuts air flow and reduces water absorption to a maximum of 4% by volume.

The board is light weight, with density only 1¼ lb/cu ft. It is easy to install in walls, floor, and roof of truck bodies or trailers. Applied by cold adhesive method. Furnished in standard size pieces, 36 x 36", in 1, 1½, 2, 3, and 4" thicknesses.

(Armalite insulation is made by Armstrong Cork Co., Dept. FP, 3011 Robbins Ave., Lancaster, Pa. . . . or check 4866 on form opposite last page.)

THIS FLOOR IS *Corrosion-proof*

SAUEREISEN No. 40

was used in laying this floor at a major brewing plant. Bottling alkalis and food acids resulting from processing have no effect on such a floor, because it is water-proof, and easily kept clean. Sauereisen No. 40 is a quick-setting, self-hardening resin base cement providing a mortar that can be troweled, so that floors are lastingly corrosion-resistant.

40 A *Tell us your floor problems! Write for catalog.*

Sauereisen Cements Co., Pittsburgh 15, Pa.

When inquiring check 4867 opposite last page

New BUSCHMAN **TROJAN "A"** Portable Belt Conveyor

• *Faster*
• *Safer*

Rugged ALUMINUM ALLOY BOOM provides easier maneuverability . . . greater versatility!

UP . . . DOWN or any angle you want Hydraulically

- Reversible Travel: 12" Belt
- 10', 12', 14', 16', 18' and 20' lengths
- One-man operation . . . on-the-job economy
- Adjustable ultra-lightweight boom folds for easier shipment, storage
- Practical "booster" for gravity systems

WRITE TODAY!

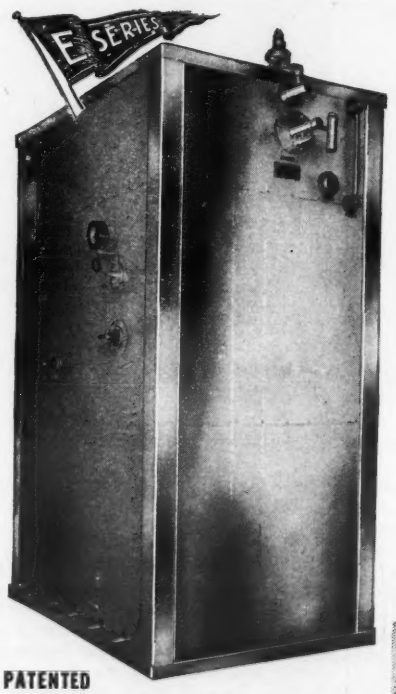
PRODUCE MORE FOR LESS with Buschman CONVEYORS C-338-EWB

Get cost-cutting details on the economical TROJAN "A" . . . ask for Bulletin #50AA.

THE E. W. BUSCHMAN CO.
4411 Clifton Ave., Cincinnati 32, Ohio

When inquiring check 4868 opposite last page

The *"KING ZEERO"* Builds and STORES Cooling



PATENTED

during off-peak hours

Stored Ice and Direct Expansion furnish 32°-34° circulating water for all product cooling needs.

COMPLETELY AUTOMATIC IN OPERATION

May also be used with an AIR CONDITIONING UNIT

The Proved Standard for Product and Air Cooling

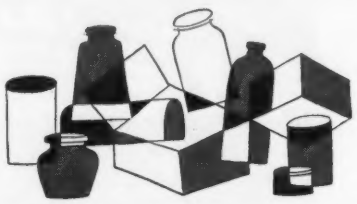
- The "King Zeero" delivers the COLDEST water LONGER, for less outlay. -- affords maximum economy in operation and maintenance. Smaller compressor needed lowers demand charge.

The sales representatives of the leading lines of dairy and refrigeration equipment who call on you will be glad to discuss details with you.

THE KING ZEERO COMPANY
4300-14 W. Montrose Ave. - Chicago 41, Ill.
Manufacturers of Ice Builders - Ice Builder Cabinets - Ice Banks

When inquiring check 4869 opposite last page

packaging viewpoint



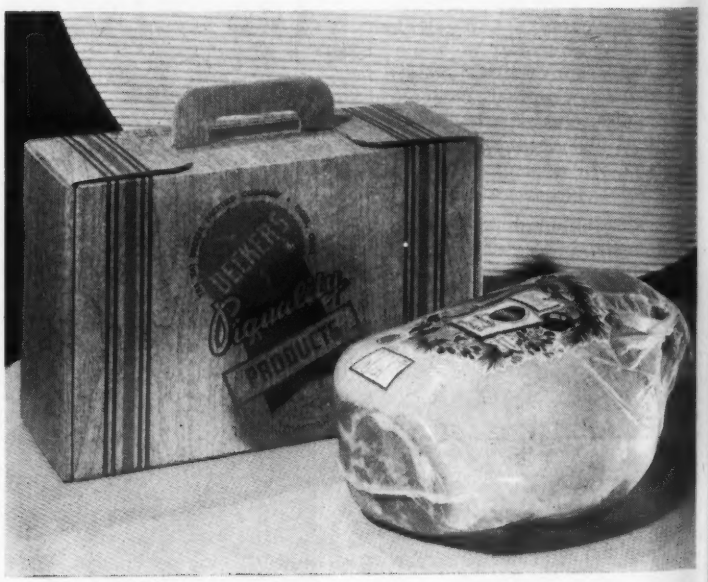
What's new in products and package design . . . a pictorial presentation . . .

"Picture- window" on back of pouch . . .

. . . shows off corned beef slices for Hygrade Food Products Corp., Detroit. Front of vacuum-sealed "Mylar" and polyethylene pouch features a striking color illustration of tray of corned beef. Hygrade reports a 30% sales increase over 7-month period for its "Mylar"-packaged luncheon meat line. Other advantages stated are better color retention, flavor protection, and reduction in leakers. "Mylar" is supplied by E. I. du Pont de Nemours & Co., Inc., Dept. FP, Wilmington 98, Del.

Hot barbecue bread's "in the bag" . . .

. . . of gleaming Alcoa Wrap foil. Special bread is heated right in the bag on grate of the open hearth. Bags also help retain bread freshness longer, attract the eye with color printing on aluminum foil. Bread types shown are quickly identified by use of red ink on one wrap, green on the other. Sales reports, based on short trial selling period, indicate high customer appeal. Design and flexographic printing is by Milprint, Inc., Dept. FP, 4200 N. Holton St., Milwaukee 1, Wis.

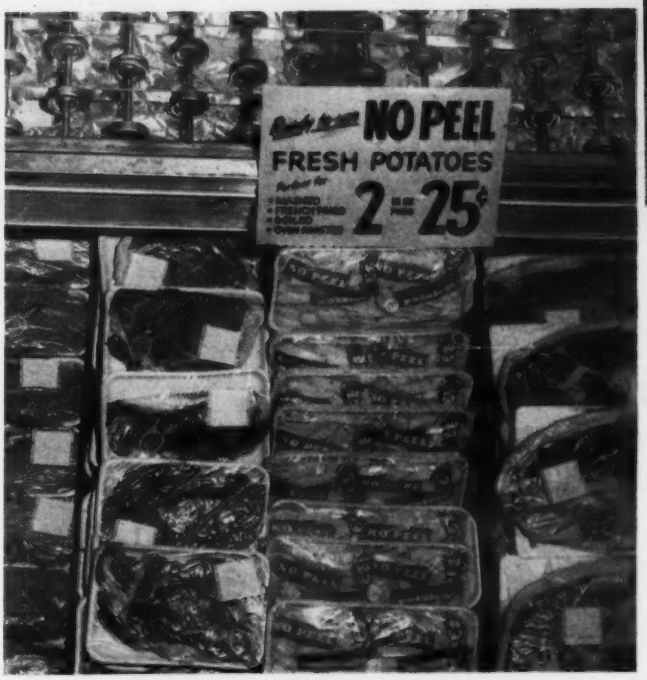


"Suitcase" brings smoked piggy to market . . .

. . . and makes him easy to carry "all the way home". Luggage-style corrugated box, red- and blue-printed on simulated wood grain, has boosted ham sales, even at slight premium price, for Val Decker Packing Co. of Piqua, Ohio. Unique carry-out carton, with built-in handle. Package also is different enough to suggest gift possibilities. Over-all size is 14-1/8 x 9¼ x 5-5/8". Designer and producer is Hinde & Dauch Paper Co., Dept. FP, 1503 Decatur St., Sandusky, Ohio.

Glass lid "hitch hikes" atop vacuum closure . . .

. . . of glass jar containing special shrimp and salad dressing. Bands of red tape attach glass lid which becomes cover once the regular closure is removed on product of Cream Wipt Foods, Inc. of Philadelphia. Resulting package is both functional and attractive in shape and color contrast. Jar and glass lid is furnished by Owens-Illinois Glass Co., Dept. FP, Toledo 1, Ohio; metal closure by White Cap Co., Dept. FP, 1819 N. Major, Chicago, Ill.



Meat and potatoes going steady . . .

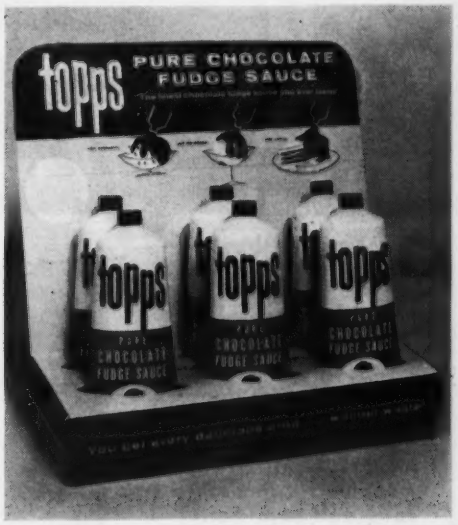
. . . because of rapid sales allure and convenience of handling. No-Peel potatoes — pre-peeled, sliced, and processed to retain freshness for 3 weeks at 35 to 40°F — inspired impulse buying, repeat purchases in 2-week trial on meat counters of Daitch Shopwell Stores, metropolitan New York supermarket chain. As result, these ready-to-fry or boil potatoes will continue on Daitch meat counters. Each 12-oz polyethylene package is equivalent of one pound of fresh, unpeeled potatoes. Price labels are cellophane-taped to package. Makers of No-Peel are United Pre-Pared Products Corp., Dept. FP, Mount Vernon, New York.

Two-faced design solves problem . . .

. . . for a product that outgrew its label. Used for years only as cream in coffee, Milnot's expanded popularity for other uses required a label re-design to tell the changed story. The new design solved the main problem — need for a variety of illustrations — and also such others as difficult brand identification, weak color scheme, complicated face panel, and dead back panel. Redesigned package, in 2 sizes, retains the original color scheme of red, yellow, and blue. Label designer is Dickens, Inc., Dept. FP, 908 Ernst Court, Chicago 11, Ill.

Pillsbury's BEST new package idea . . .

. . . is a 14-oz "flour-shaker" can. Metal disc top on round, foil-covered can rotates to perforations for shaking out all-purpose flour or to larger opening for spooning or pouring. First new flour package in over 30 years is designed for range or counter-top use. Off-white label is punctuated with blue Pillsbury bull's-eye trade mark. Back has directions for white sauces and gravies. Designed by Aluminum Company of America, Dept. FP, Alcoa Bldg., Mellon Sq., Pittsburgh, Pa., and produced by R. C. Can Co., Dept. FP, 9430 Page Blvd., St. Louis, Mo.

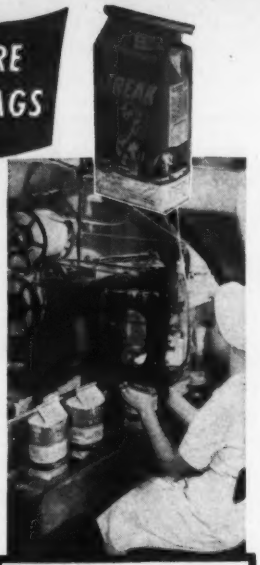


Plastic tube for fudge sauce . . .

. . . rolls out heavily viscous product on ice cream, desserts, etc., with gentle squeeze. When pressure is released, unique draw-back action keeps container neat and clean. Leak-proof tube of pure white BRACON polyethylene can be overprinted in colors for maximum product identification. Shape prevents rolling on working surface. Container can dispense many other paste-like food products. Folding display platform is die-cut to hold 6 units. Product of Bradley Container Corp., subsidiary of American Can Co., Dept. FP, Maynard, Mass.

V 18 7 JUL 57 UMI

A BETTER CLOSURE for SMALL PAPER BAGS



UNION SPECIAL'S Style 60000 D bag closing machine, producing the exclusive Dubl-Tape closure, is designed to speed packaging . . . cut costs . . . and improve appearance.

- **FAST—Speed to match output of standard filling and weighing equipment.**
- **NEAT—Produces an eye-pleasing, sales-stimulating package with high merchandising value.**
- **ECONOMICAL—Operating cost per bag is at a minimum . . . uses inexpensive cotton thread and paper tape.**
- **VERSATILE—Adjustable for a wide range of bag sizes, short or long runs.**

Write for BULLETIN No. 100 to get the complete facts on this machine . . . and how it can do a better closing job for you.

Union Special MACHINE COMPANY

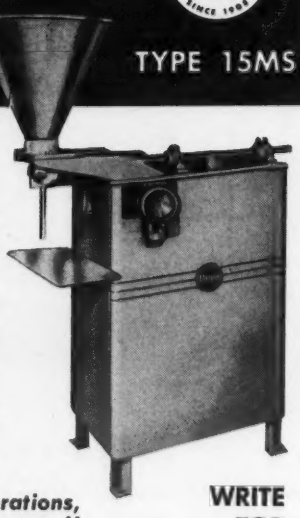
432 N. Franklin Street • Chicago 10, Illinois

When inquiring check 4870 opposite last page

NEW . . .

Hope ESTABLISHED SINCE 1903

FILLING MACHINE TYPE 15MS



. . . You can buy several for less than the cost of one big machine

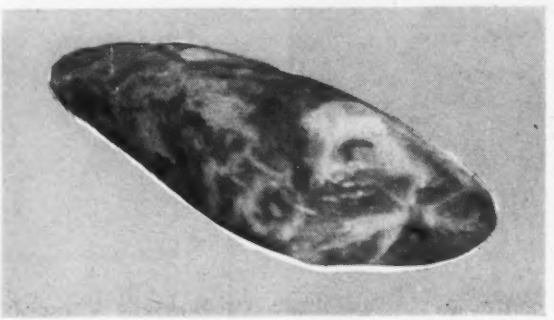
Another first for Hope . . . This new, small, streamlined floor model accurately handles liquid, viscous and semi-solid products quickly and at the lowest possible cost! Excellent for pilot runs, small operations, laboratory testing, small batches and short production runs of a color or product.

WRITE FOR DETAILS

HOPE MACHINE COMPANY

9400-20 STATE ROAD • PHILA. 14, PA.

When inquiring check 4871 opposite last page



Hold fresh meat 2 weeks or more

Oakland Packing uses CRYOVAC vacuum packing process to eliminate trim and shrink loss

LLOYD HATOFF, Partner
Oakland Packing Company
as reported by **WALTER KAISER,**
Asst. Managing Editor

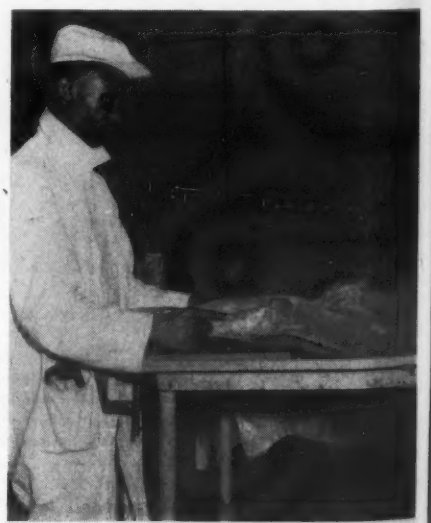
The CRYOVAC process, which has well-known application in poultry and processed meats, is being successfully extended to fresh, red meats at Oakland Meat Company a Chicago purveyor.

The unique CRYOVAC process consists essentially of wrapping meats in a special moisture and gas-proof bag, removing the air by use of a vacuum, and shrinking the package skin tight to the shape of the meat. Use of this packaging method has enabled Oakland to quadruple storage life of institutional meat cuts without the shrinkage and trim loss which traditionally has been part of the aging process.

Oakland is a purveyor to hotels, restaurants, and institutions, breaking prime and choice beef into a number of boneless cuts, such as sirloin butts, strip loins, shell loins, full tenderloins, beef briskets, etc.

The CRYOVAC packaging process works like this: After the meat is cut, it is placed on a mandrel and the bag is pulled over it. The neck of the bag is slipped over the vacuum nozzle of a CRYOVAC packaging machine and a 15" vacuum is pulled on the bag for 15 to 30 seconds. The bag is then automatically twisted, sealed with an aluminum clip and excess film is cut off. The air-tight package is then dipped momentarily in 200°F water which shrinks the bag effecting a perfect contour cling which eliminates the possibility of air pockets. After shrinking, the bagged product is moved to refrigerated storage.

For Oakland, two weeks of shrink-free storage life has meant a number of economies. In buying, this purveyor finds it can take advantage of favorable prices. In aging, he has eliminated shrinkage and trim loss on his product and avoided



After cuts are made, they are placed on mandrel and bags pulled over them

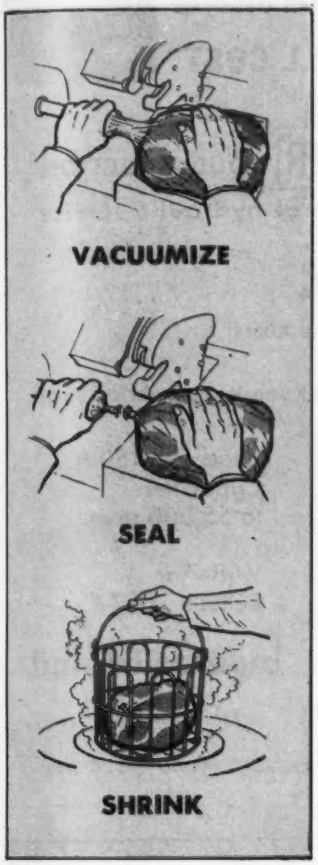


Diagram illustrates steps followed in packaging fresh meat cuts

paying additional labor costs. Oakland has also found that they can fabricate for inventory, thereby cutting down on overtime and idle time and providing better service to customers.

By using CRYOVAC, Oakland also finds that it has done its own customers an invaluable service. These customers are taking advantage of extra storage life, buying larger orders when prices are lower and storing the meat in their own coolers. This means that they, too, can hold inventory and prevent running short on profitable, fast-selling cuts. This in turn is beneficial to Oakland, since larger orders mean savings in delivery costs.

(CRYOVAC bags and packaging equipment are supplied by The CRYOVAC Company, Dept. FP, Cambridge 40, Mass. . . . or for more information check 4872 on form opposite last page.)

Sell it on sight . . . *with plastic containers made of Styron*

Give your delicatessen foods the visual appeal that old-fashioned containers can never provide. Dress them up to sell in sparkling plastic containers made of Styron® . . . the package that is proving its claims in supermarkets across the country.

Styron plastic containers meet all the demands of these perishable foods—complete protection, easy handling, fresh visual appeal, extra merchandising advantages. Hundreds of standard shapes and sizes are available . . . crystal clear, opaque or in color . . . imprinted or labeled. All have tight-fitting lids.

If you prepare or package delicatessen foods, let Dow put you in touch with manufacturers who can supply these containers promptly. If you buy these foods, make sure they come to you in Styron plastic containers. That's the easiest way to make sure they look better . . . stay fresher . . . sell on sight! THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Dept. PL1519N.

THE DOW CHEMICAL COMPANY
Plastics Packaging Service PL1519N
Midland, Michigan

Please send me the Catalog of Packages.
Item to be packaged_____

NAME_____ TITLE_____
FIRM NAME_____ ADDRESS_____
CITY_____ ZONE____ STATE_____

YOU CAN DEPEND ON DOW

When inquiring check 4873 opposite last page

Greater Production Flexibility with Screw-Lift - Screw-Veyor

PATENTED AND TRADE MARK REG U S PAT OFF — PATENTED AND TRADE MARK REG U S PAT OFF

IMAGINE your bulk materials being handled by a series of horizontal and vertical screw conveyors operating within a tube! That's what a Screw-Lift — Screw-Veyor system is — and it offers push button control at any stage from receiving to storage, to reclaiming for processing and/or to ultimate packaging.

Screw-Lift, Screw-Veyor systems are dust-tight, moisture-proof and require little operating space . . . entire assembly is enclosed and operates anywhere a pipe line can be run — no manual attention — cannot clog at junctions — offers sanitation, safety and reduces fire hazard. Patented design advantages place Screw-Lifts and Screw-Veyors in a class by themselves. Thousands in use handling a multitude of different materials.

Contact us before making commitments on your material handling. We can show you how a Screw-Lift, Screw-Veyor system will save many dollars in installation and operating costs.

Three of the largest feed processing plants in the U.S.A. have over 100 Screw-Lifts in continuous operation
Screw Conveyor Corporation
HAMMOND, INDIANA
HAMMOND MANUFACTURED

When inquiring check 4874 opposite last page

The NEWEST **FALCON BLENDER**

ADVANCED DESIGN

Send for Bulletin

- Approved SANITARY by Municipal Authorities
- Unique Double Ribbon For Faster efficient Mixing
- All Sizes usually in Stock in Stainless or Mild Steel
- Requires Less Power per load
- Smooth Rounded Interior No projections to retain material
- Ribbon Assembly quickly removable for cleaning
- Jackets Available for Heating or Cooling
- The FALCON is competitively priced

STAINLESS KETTLES, REACTORS, TANKS

The **FALCON** MANUFACTURING DIVISION OF

The FIRST MACHINERY CORP.
211 TENTH ST., BROOKLYN 15, N.Y. ST. 8-4672

When inquiring check 4875 opposite last page

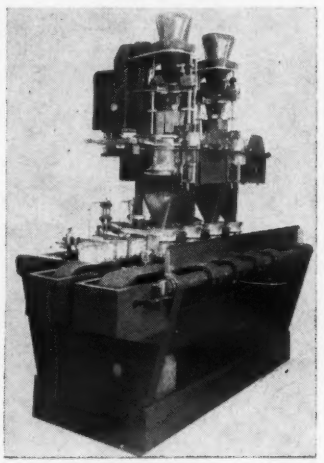
packaging

Feeds, weigh-fills, packs, ejects 15-145 cans/min

Weighs fine powdered products to 1/64 oz

Uses: For automatically feeding, weigh-filling, packing, and ejecting cans to closing machine conveyor at rates of 15 to 145/min.

Features: Power feed enables net weigher to weigh most all dry powdered materials, even very fine pulverized products, with accuracy



Dual can lines with net weigher for each

of 1/64 oz, plus or minus, with 1 lb weights. Accuracy of each discharge is indicated instantly by pointer and dial.

No operator is needed if cans are brought by gravity or other means to can feeding conveyor. Only occasional supervision of weights is required to assure extreme unit weight accuracy.

Description: Interlocking controls automatically place empty cans in receiving position under weigher discharge spouts, as the filled and packed cans are ejected to continuous belt conveyor feeding to closing equipment. Packing is accomplished with cans in stationary position, with packer mechanism enclosing can to prevent spillage.

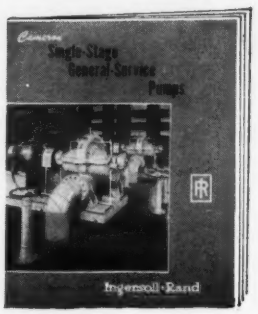
(Bar-Nun weigher, with or without can line equipment, is available from B. F. Gump Co., Dept. FP, 1325 S. Cicero Ave., Chicago 50, Ill. . . . or check 4876 opp. last page.)

need a pump that assures **LOW OVERALL COST** ?

Look into these IR **DOUBLE-SUCTION** pumps for general hydraulic service

- High Efficiency plus
- Low maintenance costs mean

Lowest overall expense year after year



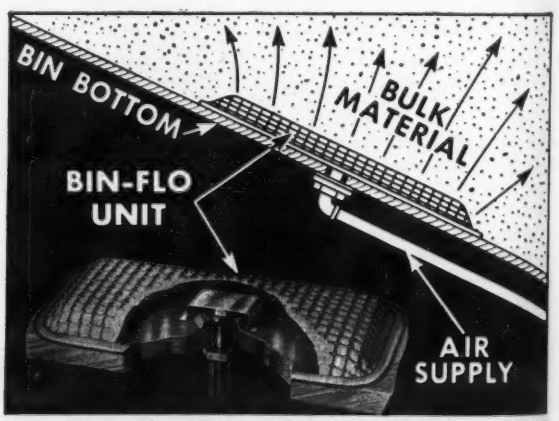
Heads: to 450 ft.
Capacities: to 55,000 gpm.

Write for Bulletin 7057-C

10-589

Ingersoll-Rand
11 Broadway,
New York 4, N.Y.

When inquiring check 4877 opposite last page



BIN-FLO USES SMALL VOLUME OF AIR AT LOW PRESSURE

KEEPS BULK MATERIALS MOVING

BIN-FLO units in bins, chutes, hoppers, etc., restore flow characteristics to dry, finely ground materials which tend to pack or bridge in storage. Types for all materials and conditions. No moving parts; simple installation; negligible operating cost; no maintenance cost.

BIN-DICATOR the original diaphragm-type bin level indicator. In successful use for over 20 years. **ROTO-BIN-DICATOR** new, motor-driven paddle type; excellent on bins under pressure or vacuum, and for general application. Also explosion-proof units, U.L. listed.

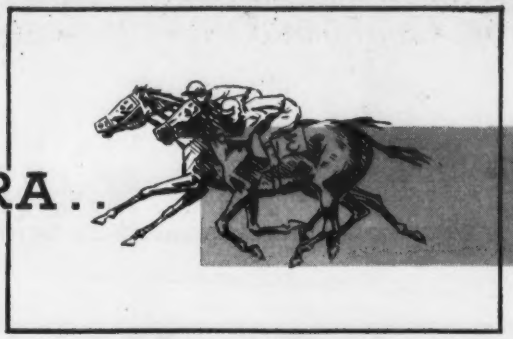
THE BIN-DICATOR CO.
13946-C Kercheval • Detroit 15, Mich.

Write for detailed literature or call
VAlley 2-6952

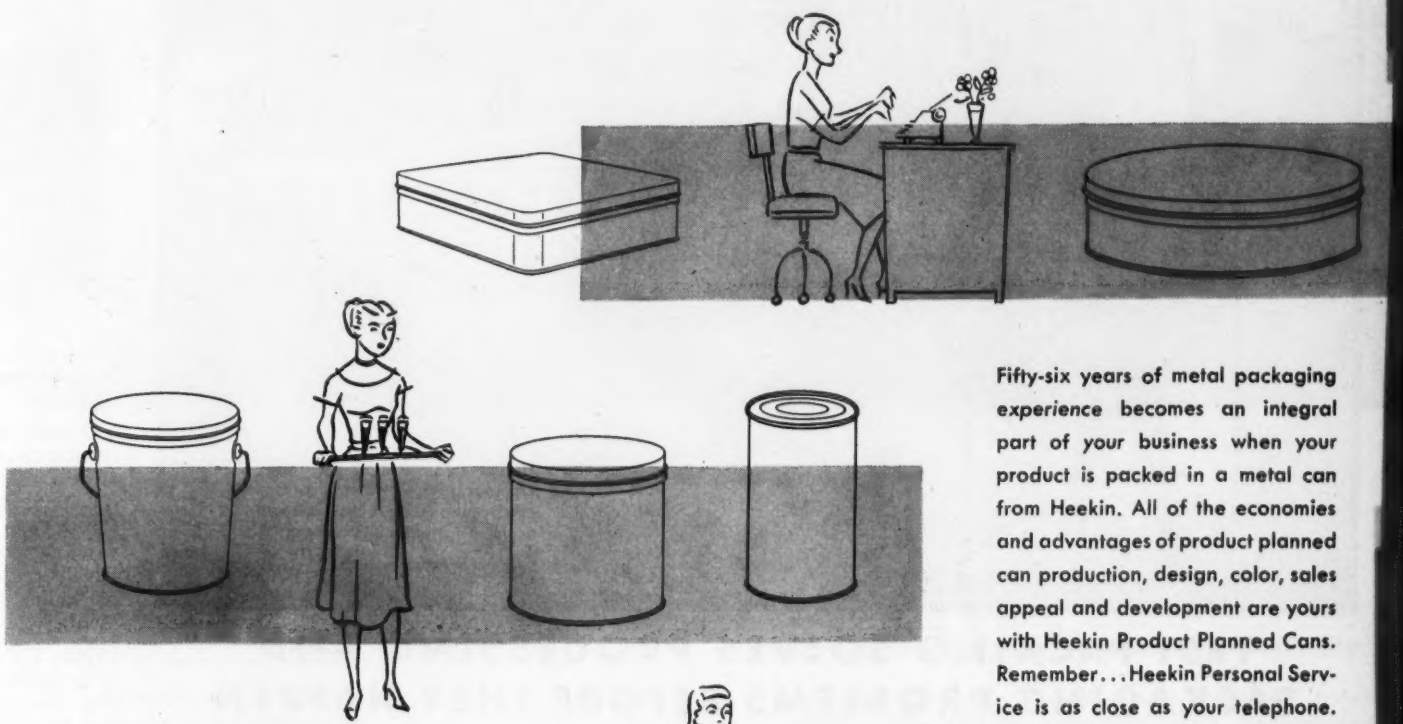
WE SELL DIRECT • PHONE ORDERS COLLECT

When inquiring check 4878 opposite last page

THAT LITTLE EXTRA . .

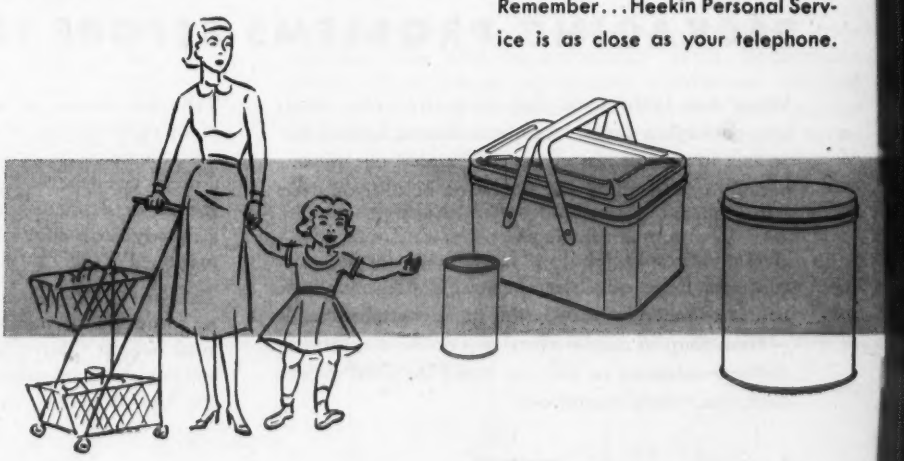


MEANS SO MUCH . . in Metal Packaging



Fifty-six years of metal packaging *experience* becomes an integral part of *your* business when your product is packed in a metal can from Heekin. All of the economies and advantages of product planned can production, design, color, sales appeal and development are yours with Heekin Product Planned Cans. Remember . . . Heekin Personal Service is as close as your telephone.

HEEKIN
Product Planned
CANS

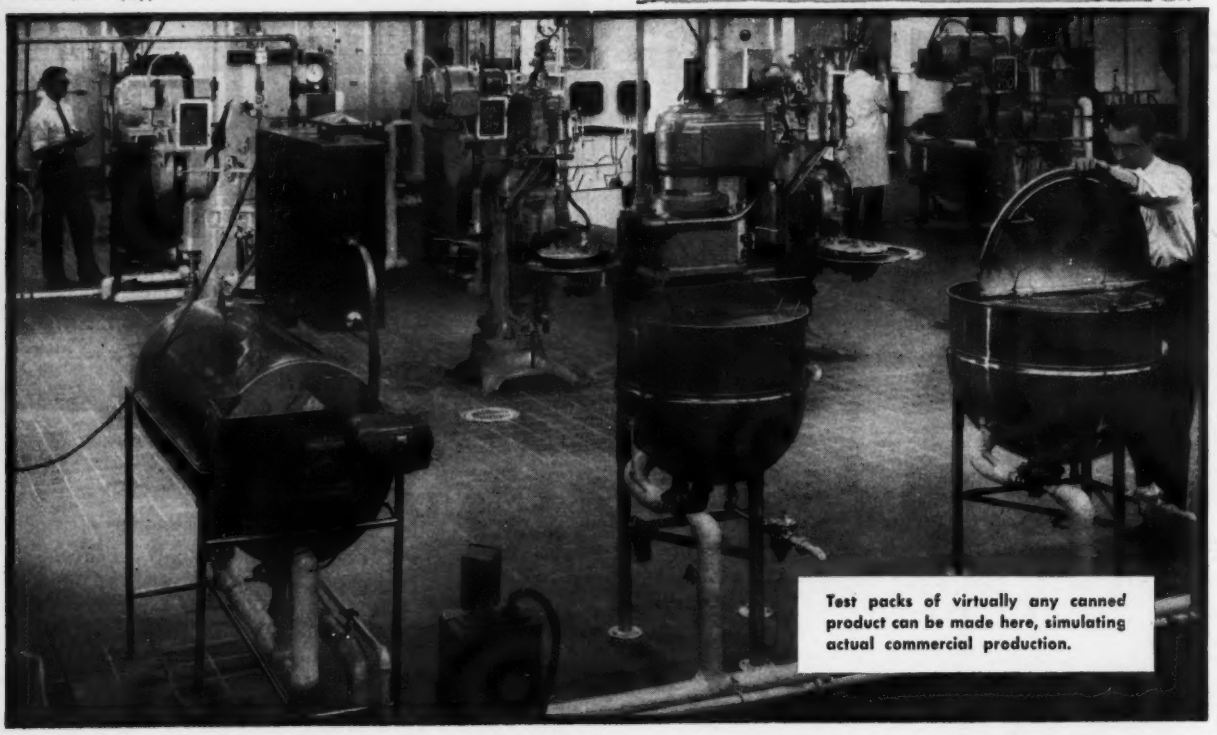


THE HEEKIN CAN CO. *PLANTS IN OHIO, TENNESSEE & ARKANSAS—SALES OFFICES; CINCINNATI, OHIO; SPRINGDALE, ARKANSAS*

When inquiring check 4879 opposite last page

V 18 7 JUL 57 UMI

*Report from Continental's new Research Center**



Test packs of virtually any canned product can be made here, simulating actual commercial production.

TEST PACKING SOLVES PROCESSING AND PACKAGING PROBLEMS *BEFORE* THEY HAPPEN

What does Continental Can Company know about *your* packaging and processing problems? Quite a bit. In fact in many cases we get the "kinks" out of your packaging and processing operation before you even know they exist.

At Continental's fabulous research & development center, a huge pilot area is equipped to duplicate actual commercial production of any product made — from soup to nuts — every step of the way. So our recommendations to you are based on solid experience, not merely hypotheses.

Take soft drinks for example. Our engineers tested many compositions of metal before developing a can with the necessary strength for high carbonation, plus a protective enamel lining. Liquid detergents needed special experiment too, until Continental produced a sturdy, non-corrosive can that could be easily marketed.

This pre-testing research can help you too. If you're a Continental customer . . . or would like to be, call your nearest Continental representative. Our experts and engineers are eager to help you solve your packaging and processing problems.

QUALITY Continental SERVICE

CONTINENTAL CAN COMPANY

*TOP AWARD WINNER

For the excellence of its modern, scientific design, Continental's new $7,500,000 Chicago research center has won the honor award of the American Institute of Architects and the Chicago Association of Commerce and Industry.

Eastern Division: 100 E. 42nd St., New York 17 • Central Division: 135 So. La Salle St., Chicago 3 • Pacific Division: Russ Building, San Francisco 4

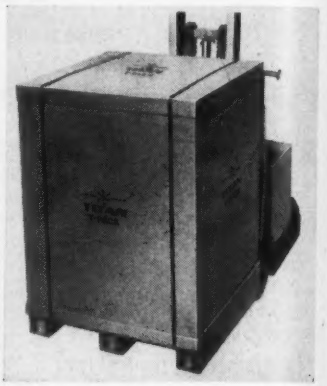
When inquiring check 4880 opposite last page

packaging

Disposable, self-palletized bulk container

Simplifies handling of powder and granules

Features: Container is expendable, eliminates multiwall bag and wooden pallet investment, individual loading, sealing, and handling costs.

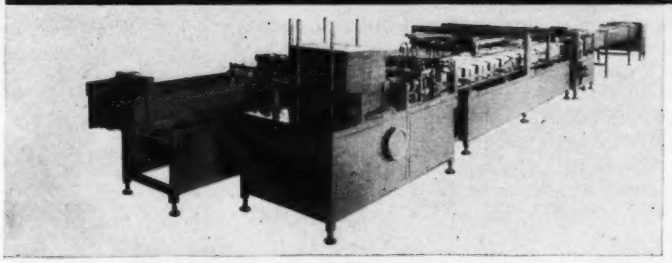


Bulk materials container is self-palletized and expendable

Description: Of paperboard construction, it is resilient and offers good protection from crushing. Size is 35x35x48". Capacity is up to 2000 lb, depending on material density. Height may be varied to meet partciular product requirements.

(Titan T-Pack Bulk Container is a product of Titan Pallet Co., Inc., Dept. FP, 527 Madison Ave., New York, N.Y. . . . or for more information check 4881 opposite last page.)

"Hey Joe, . . . do you remember any two cent sale?"



Packomatic

T.M. Reg. U. S. Pat. Off.

equipment feeds, forms, positions, loads, seals, and imprints shipping containers automatically

PACKOMATIC GALLON-CAN CASE LOADER

Packomatics high-speed, continuous-motion case forming, feeding, loading and sealing machine, shown above, oiled the way at the Esso Standard Oil Company plant for faster fully-automatic casing of gallon cans. This is the only machine on the market designed for cost-reducing end-loading style corrugated shipping containers. Custom-Engineered to accomodate cans from the 12 oz. size to the 5-qt. Imperial gallon size, for an almost endless variety of products—from foods, juices and beer to paint, chemicals and cleansers.

J. L. FERGUSON CO. Joliet 5, Ill.

New York, Chicago, Cleveland, Boston, Tampa, Baltimore, Portland, Denver, Los Angeles, San Francisco, Seattle, New Orleans, Louisville, Kansas City and All Principal Canadian Cities.

PACKOMATIC machines include the Bale Sealer — Case Sealers — Opener-Loaders — Case Imprinters — Telescoping Volumetric Filler — Packer-Gluers. Units available, semi-automatic or fully-automatic depending on your needs.

Just stack the magazines with "knocked-down" containers. The rest is automatic. With Packomatic Custom-Engineered equipment, containers are fed out, formed and positioned, end-loaded with cartons or cans, sealed and imprinted 4-sides (serial numbered, if desired) ready for shipment. Packomatics do the whole job—or any part of it. And how they pay off in any plant! End-loaded cases require up to 28% less board. Labor costs shrink dramatically and your packaging line keeps pace with your production line. Your Packomatic line can grow as you grow, too. Start now with a case opener and loader, or case sealer, or imprinter—build it unit by unit into a complete system.

For more information on product at right, specify 4882 see information request blank opposite last page.

Six 5-qt. cans or gallon cans in 20⅛" x 13⅜" x 9 3/16" case and 20¼" x 13¾" x 8¼" case

Twelve 46 oz. cans in 21" x 13" x 7⅛" case

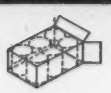
Twenty-four cartons in 12½" x 10⅛" x 8½" case

Eighteen 7 & 8 oz. cartons in 20" x 14⅞" x 8⅛" case

Sixty cigarette cartons King Size: 17⅞" x 11½" x 22" Regular: 14 13/16" x 11½" x 22"

TYPICAL CASE LOADING PATTERNS FOR CANS AND CARTONS

Twenty-four 12 oz. cans in 16⅜" x 10 15/16" x 5 9/16" case


Six No. 10 cans in 22 1/16" x 17⅜" x 7⅛" case

Thirty 1 lb. cartons in 16⅛" x 10 9/16" x 7¼" case

Twenty-four cartons in 19⅓" x 10⅞" x 7" case

Forty-eight cartons in 22¾" x 23½" x 15⅝" case

Model "C" closed-top tanks. Vertical sizes, 750-3500 gallons. Horizontal sizes, 500 to 5000 gallons.

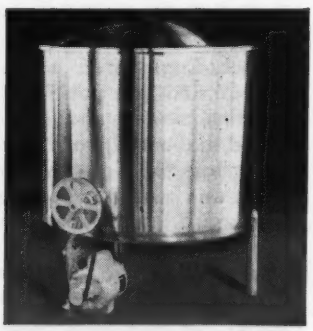
Is this stainless steel tank big enough . . . or too big?

When you order tanks from Cherry-Burrell there's no such thing as a size limitation. Our *standard* stainless steel tanks range from 60 gallons through 5000 gallons capacities—larger and smaller tanks available on special order.

Just tell us what size you need, whether you want a single shell tank or one for heating and cooling, closed top or open top types. Your Cherry-Burrell Representative can tell you how we do it. Why not give him a call or write for literature?

Typical Cherry-Burrell Tank Uses

- Water Storage
- Ingredient Storage
- Syrup Making
- Liquid Sugar Making
- Liquid Sugar Storage
- Corn Syrup Storage
- Bulk Storage of Bottling Syrup



Model "O" open-top tanks; capacities 60 to 500 gallons.

CHERRY-BURRELL CORPORATION

427 W. Randolph Street, Chicago 6, Ill.

Dairy • Food • Farm • Beverage • Brewing • Chemical • Equipment and Supplies

SALES AND SERVICE IN 58 CITIES—U.S. AND CANADA

When inquiring check 4883 opposite last page

fp **SANITATION AND MAINTENANCE**

Seasonal labor jobs can be hazardous —
Untrained personnel get injured or lame . . .
Efficiency drops, absenteeism increases . . .

here's how pear packers increase

Safety is a year-round job — even for employers of seasonal help. This is the valuable lesson learned by some 14 major pear packers in the Medford, Oregon, area. Their year-round program has paid off in increased worker efficiency during the hectic packing season, and in reduction of injuries, and lowered absenteeism.

Basic elements of the production-safety plan are the managers or their representatives, supervisors, and the "year-around" maintenance men. However, they don't conduct their safety program entirely alone. They receive periodic aid from safety engineers of their insurance companies. These accident-prevention experts offer consulting advice when and where needed, plus regular inspection of all phases of the plant and orchard operations.

Foremost in prevention of on-the-job accidental injuries are some of the prominent Medford pear packers:

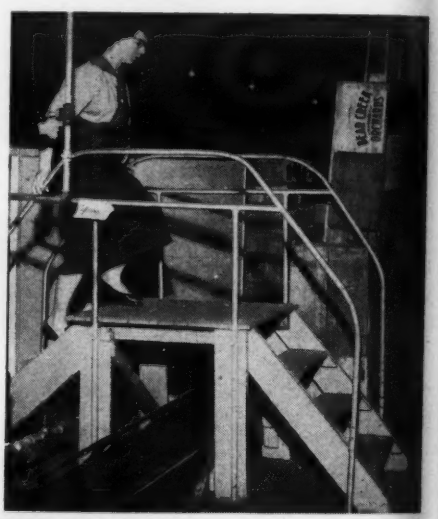
Harry and David
Southern Oregon Sales, Inc.
Newbry Orchards
Nye & Naumes and Crystal Springs Packing Co.
Rogue River Orchards

Here's how this mutually cooperative industry has attacked, and licked, the safety problem.

Pre-Season: Equipment is renovated, and all safety guards inspected and repaired; year-round supervisory staff is instructed by their superiors, and safety engineers. Courses in first aid are given to foremen and supervisors.

Just prior to packing: Pre-season packing schools are conducted by qualified instructors of the Fruit Growers League and

(*Continued on page 74*)



Up and over low-level conveyor the safe way. Well-lighted cross-overs are designated by signs, and stepping or jumping over conveyors is prohibited

Good housekeeping prevents accidents in pear packing operation. This plant stresses continual floor cleanliness (man with back turned is sweeping), good lighting, easily adjustable individual packing tables

worker efficiency, lower accidents

Pear pickers, who must work on ladders, are carefully selected for safety-sense, in addition receive positive instructions on ladder safety. This workman is harvesting pears at Harry and David's Orchards, Medford, Oregon

Protect your equipment and reputation with an Eriez permanent magnetic separator, designed to pull tramp iron from feed and grain processing lines of all types.

Magnetic ideas from ERIEZ

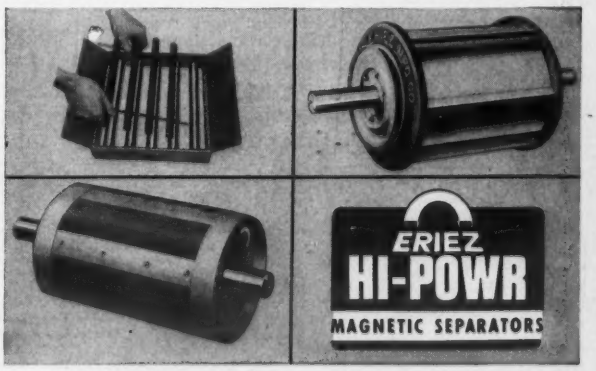
Don't take chances! Tramp iron in your product can damage expensive machinery . . . cause fires . . . kill cattle and poultry . . . hurt your reputation. Safeguard your investment with one of the many Eriez magnetic separators available to the milling industry. An Eriez Plate Magnet in a food processing line (shown here) traps about a pound of tramp iron daily, and is annually saving $5000 in repairs, plus 200 man-hours in downtime. You, too, can have this same low-cost protection with Eriez.

NEW! **Eriez HI-VI electro-*permanent* magnetic vibratory equipment NEEDS NO RECTIFIER . . . operates for less with exclusive "Double Action Drive."**

First electro-permanent magnetic units operating at 3600 CPM directly off an AC line! Just plug in . . . no rectifier needed! Compact, lightweight, easily installed. *HI-VI Unit Vibrators* keep bulk materials flowing freely through bins, chutes, etc., prevent pile-ups and bridging. *HI-VI Vibratory Feeders* (for accurate and automatic feeding) give a liquid-like flow to bulk materials. Alnico V magnetic element, the heart of the units, provides high operating efficiency at low cost. Write for complete HI-VI literature.

Grate Magnet—ideal for surge-or choke-fed lines. Material is directed by iron grill onto powerful magnetic tubes. For floor openings, hoppers, chutes, and ducts. Also drawer type models for enclosed passages.

Magnetic Drum—used when materials are not conveyed on belts. For wet or dry lines. Accumulated iron is automatically dropped out of the magnetic field, away from the material. Various drum widths and diameters.

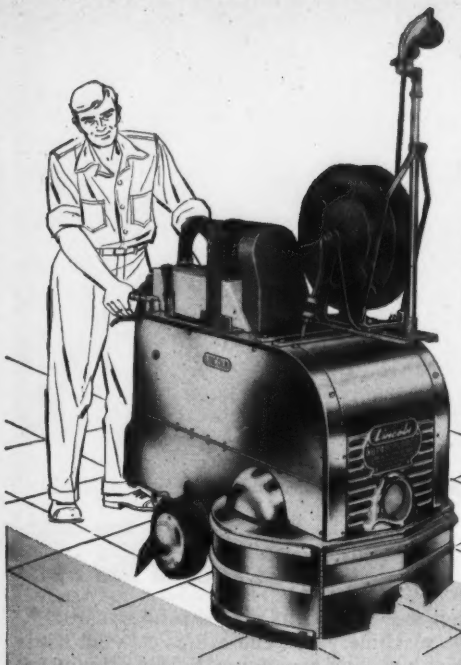


Magnetic Pulley—for separating tramp iron from materials conveyed on belts of rubber, canvas, leather, stainless steel or any other non-magnetic substance. Automatically cleans itself of accumulated iron. Belt widths and diameters in varying sizes.

FREE LITERATURE on all these magnets mailed on request. Write to: Eriez Mfg. Co., 75U Magnet Dr., Erie, Pa.

All Eriez Magnets are non-electric, self-contained, easily installed. They operate without any wires or attachments. Magnetic power is guaranteed forever . . . first cost is the last.

When inquiring check 4884 opposite last page



want fully automatic FLOOR CARE? get the LINCOLN SCRUBBER VACUUM...

ONE MACHINE DOES 5 JOBS:

spreads solution, scrubs, rinses, picks up, dries

You, too, will find big dollar savings with a modern efficient Lincoln Auto-Scrubber. Outperforms 5 to 36 men using deck scrub brushes and mops. Does *all* the work in a single automatic operation. Five models, 18" to 60" scrubbing width for all floor sizes, 2,000 to 1,000,000 sq. ft. or more. Available electric, gasoline, liquid propane, explosion-proof. Ask for free demonstration.

TYPICAL USERS: Parke-Davis Co. • American Cynamid Co. • Conrad Hilton Hotel • Western Union Telegraph Co. • American Tobacco Co. • Lever Brothers Co. • Chrysler Corporation • Northwestern Univ. • Trans World Airlines

PICK YOUR FLOOR AREA

Competitive demonstrations prove the superiority of Lincoln over any other make!

Floor area figured in square feet			
2,000	8 hours	3 hours	519—9.2 minutes
10,000	40 hours	15½ hours	518—46 minutes
50,000	200 hours	77½ hours	534—2.9 hours
120,000	480 hours	182 hours	530—4.4 hours
300,000	1200 hours	467 hours	537—9.0 hours
1,000,000	4000 hours	1580 hours	540—10.8 hours

Compare the savings in time of 1 man with deck scrub brush and mop; with 16" scrubber and vacuum with 13" squeegee against 1 man with a Lincoln Auto-Scrubber!

FOR BUYING FACTS WRITE

AMERICAN® FLOOR MACHINE CO. ESTABLISHED 1903

565-A So. St. Clair St. Toledo 3, Ohio

The Lincoln Auto-Scrubber is manufactured by Lincoln Floor Machinery Co., Bowling Green, Ohio.

PERFORMANCE PROVED MAINTENANCE MACHINES • SALES AND SERVICE IN PRINCIPAL CITIES

When inquiring check 4885 opposite last page

Worker Efficiency

(*Continued from page 72*)

the packer's association. Here Harry and David hold a pre-season training school for pear-packing personnel. Here the girls wrap pears in plastic under supervision. The school's double purpose is:
(1) It assures proper grading and wrapping during season, (2) provides easy break-in period for higher manual dexterity speed, and avoids such occupational injuries as "squeak-wrist".
Before season starts, insurance company safety men tour each plant under their jurisdiction, to see that all guards are in place, check other salient points.

During Season: Supervision continues; when injury does occur, prompt medical attention is given; persons trained in first aid are available; nurses are in attendance or on call at larger plants; prompt payment of workmens' compensation helps keep workers — and community — cooperative, alert, and safety conscious.

Continuing program: New machinery to relieve heavy manual tasks is installed where possible. Most packers in Medford area now use automatic box dumpers. This has minimized back strains, and also widens the age group and physical range of potential employees.

Safety aids by specialists: Safety specialists from insurance companies have furnished assistance for the following services to Medford pear packers.

Before-season training
Ladder inspection
Foreman training
Developing attitudes of safer working
Inter-plant contests
In-plant supervised washing
Daily inspection of hands
First aid instruction
Placement for ability to perform the work

(Safety programs of this type can be set up through Employers Mutuals of Wausau, Dept. FP, Accident Prevention, Wausau, Wis. Check 4886 opposite last page.)

...pouring dollars down the drain

Send the coupon below for the money- and health-saving bulletin "Why Industrial Waste Treatment?" It's a fast and thorough explanation of this growing problem of pollution and profit-shrinkage—and what can be done about it.

Rex® Industrial Waste Treatment Equipment will make your plant a good citizen in its community—and it will often pay for itself in a short time through salvage and re-use of valuable materials and process water.

Please send the coupon today. The information in this bulletin is worthy of your attention.

CHAIN BELT COMPANY
Milwaukee 1, Wisconsin

CHAIN Belt Company
4699 West Greenfield Ave.
Milwaukee 1, Wisconsin
Send me today my copy of "Why Industrial Waste Treatment?"

Name.....
Company.....
Address.....
City.....*State*.....

When inquiring check 4887 opposite last page

Plastic aisle markers cost less to maintain than paint

Diamond shaped aisle markers are easy-to-install, easy-to-see, abrasion-resistant, and unaffected by oil, grease, salts, water, or temperature changes. Available in several colors and two sizes.

(Klear-Vu aisle markers are manufactured by Lester Brossard Co., Dept. FP, 540 N. Michigan Ave., Chicago 11, Ill. . . . or for more information check 4888 opp. last page.)

Silicone bottle protective available as liquid concentrate

A silicone protective treatment for returnable soft drink and dairy bottles has been developed as a liquid concentrate, suitable for instant dilution in water. To simplify preparation and application, product is packaged in "one shot" bottles; one bottle mixed with water in an 8 to 15 gal spray tank supplies sufficient solution for a day's production on a single filling line.

Applied to bottles each time they pass through filling line, product provides a non-oily silicone lubricating film that reduces scratches and abrasion. This treatment noticeably improves gloss and attractiveness of each bottle. Processing noise level is also reduced.

(Syl-Gard 17 is development of Dow Corning Corp., Dept. FP, Midland, Mich. . . . or for more information check 4889 on form opposite last page.)

Carnation adopts Styrofoam® as an excellent vapor barrier for their new Seattle plant

Styrofoam, a Dow expanded polystyrene, was selected by Carnation Company for important applications at its new Seattle plant. Carnation has used Styrofoam in various installations during recent years.

One of the most important qualities to look for in an insulation material is its ability to resist water and moisture. Since Styrofoam itself is an excellent vapor barrier, its insulating efficiency remains constantly high throughout its life. In one room at Carnation, for example, Styrofoam helps maintain a uniform 32-34° F. range.

Styrofoam is lightweight and easy to apply to ceilings and piping. It has a neater, more finished appearance than other insulating materials . . . effectively resists rot and vermin.

For more information about Styrofoam and its outstanding properties, write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department PL1716F.

CHECK THIS EXCLUSIVE COMBINATION OF PROPERTIES

STYROFOAM* FIRST IN PLASTIC FOAM INSULATION	Insulations	Low "K" factor	Superior water resistance	High compressive strength	Light weight	Superior resistance to rot and vermin	Easy handling and fabrication	Low-cost installation	Lowest cost per year service
	STYROFOAM	●	●	●	●	●	●	●	●
	A		●	●		●			
	B	●			●			●	
	C	●		●					

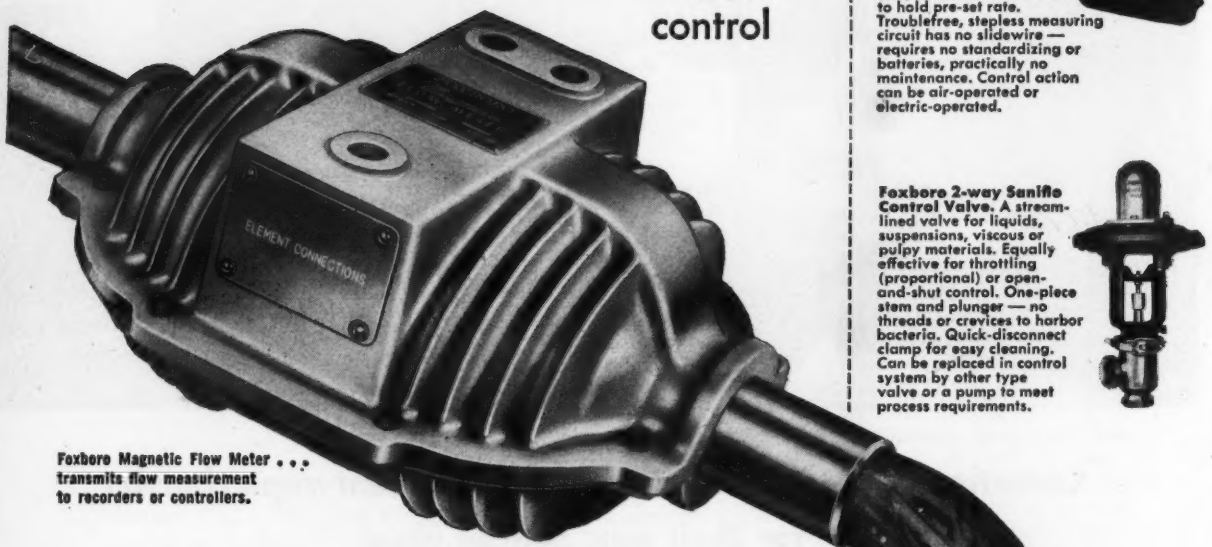
* Styrofoam is a registered trade mark of The Dow Chemical Company

YOU CAN DEPEND ON DOW

When inquiring check 4890 opposite last page

New possibilities for continuous processing!

...with Foxboro sanitary proportional flow control



Foxboro Magnetic Flow Meter . . . transmits flow measurement to recorders or controllers.

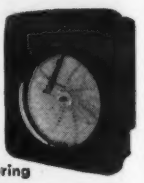
You no longer have to discard new ideas in continuous process design for want of adequate flow control! Foxboro now provides the first complete sanitary proportional flow control system ever available.

Heart of this system is the Foxboro Magnetic Flow Meter. It has proved highly successful in measurement of widely varied food products including beer, tomato products, apple juice, and grape juice. And it's equally applicable to many others, such as egg yolks, wine—even molasses! It measures *magnetically*, with no flow interference, no pockets, crevices, or projections to collect residue or contamination. And its high accuracy is sustained, despite variations in conductivity, density, and viscosity.

The Dynalog Controller and the Saniflo Valve complete the system . . . offer a complete sanitary control "package". Send us *your* flow control problem. Write The Foxboro Company, 927 Neponset Ave., Foxboro, Mass., U.S.A.

A complete, sanitary proportional flow control package

Foxboro Magnetic Flow Meter. Accurately measures the flow of virtually any liquid except non-conductors like chocolate, fats and oils. Installs easily in the line like any equivalent length of pipe. No taps, seals, purges, meter runs, or straightening vanes required. Connects by 2-conductor cable to remote Dynalog Controller.



Foxboro Dynalog Recording Controller. Responds instantly to changes in volume flow, initiates fast, accurate valve action to hold pre-set rate. Troublefree, stepless measuring circuit has no slidewire — requires no standardizing or batteries, practically no maintenance. Control action can be air-operated or electric-operated.

Foxboro 2-way Saniflo Control Valve. A streamlined valve for liquids, suspensions, viscous or pulpy materials. Equally effective for throttling (proportional) or open-and-shut control. One-piece stem and plunger — no threads or crevices to harbor bacteria. Quick-disconnect clamp for easy cleaning. Can be replaced in control system by other type valve or a pump to meet process requirements.

FOXBORO
REG. U.S. PAT. OFF.

SANITARY FLOW CONTROL

FACTORIES IN THE UNITED STATES, CANADA, AND ENGLAND

When inquiring check 4891 opposite last page

Simplified control for viscosity, moisture content

Two of the hardest variables to measure and control in food processing operations are moisture content and viscosity (or consistency). Considerable progress has been made, however, in overcoming problems connected with control of these variables.

Consistency, even of lumpy slurries, can now be measured quickly and accurately by instruments, either with laboratory units or with automatic in-line recorder-controllers.

A number of devices for measuring moisture content quickly, of nearly any food product, have also been introduced.

Most of these are laboratory instruments, but some automatic in-line units have already been developed. In addition, "standard" instruments for measurement and control of temperature, pressure, etc., are being constantly improved, so that efficiencies are greater than ever.

Actual experiences of a number of processors now reaping the benefits of these instruments are told in the featured section beginning on the opposite page.

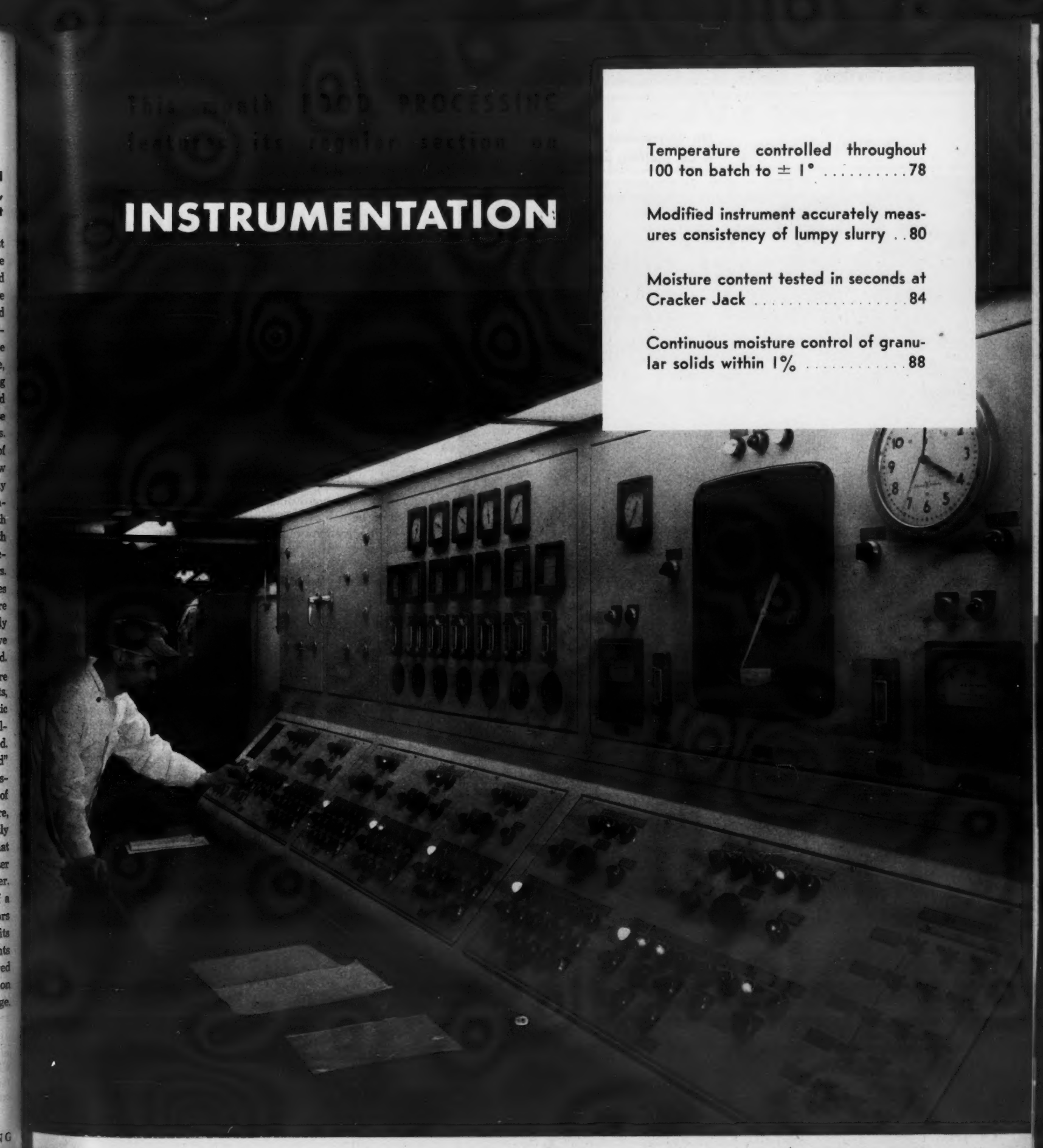
INSTRUMENTATION

Temperature controlled throughout 100 ton batch to ± 1° 78

Modified instrument accurately measures consistency of lumpy slurry .. 80

Moisture content tested in seconds at Cracker Jack 84

Continuous moisture control of granular solids within 1% 88



No 'instrument experts' needed at Albert Schwill & Co. malting plant, as electronic system

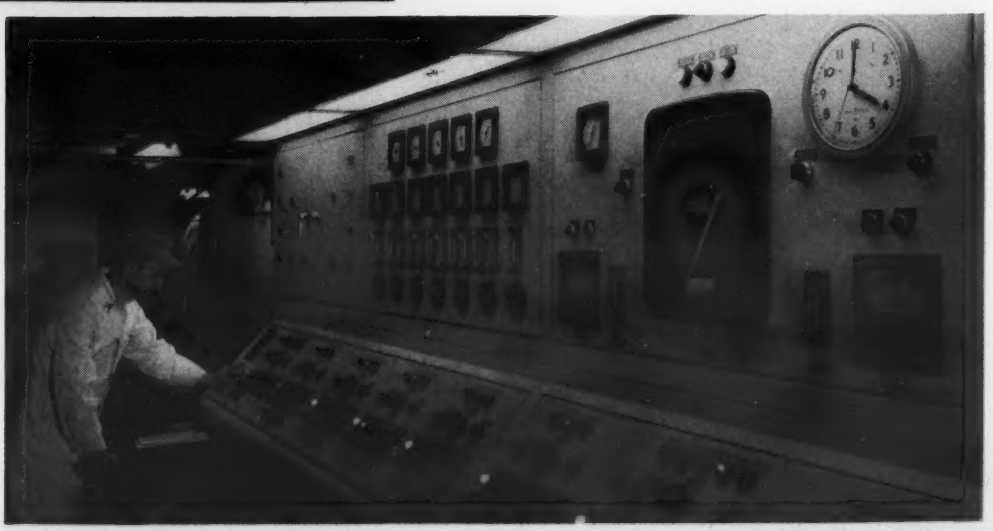
Controls temperature throughout 100 ton batch to ±1°

T. P. NELLIGAN, Exec. Vice President
Albert Schwill & Co.
as reported by **FP Staff**

Production of malt must be performed under precise, controlled conditions if uniformity from batch to batch is to be achieved. Control of this type is difficult because of the tremendous batch sizes encountered — 100 tons is not an unusual size (see photo of one of these batches at left). At Albert Schwill & Co. in Chicago, batches of this size are handled with temperature variation of only ±1°F **throughout the entire mass.** And the control system used is so dependable and straightforward that the Schwill employe roster does not include an instrument repair man.

The Schwill plant incorporates an unconventional one-story design, in which the malting section serves for both germinating and kilning. After steeping, the grain moves into one of five individual germinating-kilning compartments within the section. Each of these compartments handles a 100 ton batch, and each is equipped with its own temperature and humidity conditioning unit.

Malting-kilning compartments are precisely controlled by central electronic panel. Only the helices of the turning machine touch the grain. When kilning is completed, moving floor transfers malt to conveyor



"Nerve center" of malt house is electronically-operated control panel

Bed temperature is maintained by passing air of desired temperature through perforated stainless steel floor of compartment, and by action of turning equipment which moves through bed at about 1 ft/min. The temperature is, of course, quite critical and must be held to within ±1°F during germination and within ±1½°F during kilning. Five thermostats are located in air stream between furnaces (or refrigeration units) and compartment to maintain closely-controlled temperature.

Process is exothermic, so

All electronic components of panel are plug-in type. In case one fails, it's merely pulled from place and replaced with spare

tempered air must be used at all times to maintain desired temperatures. Both outside air and mechanical refrigeration are used as source of cooling. Conditions in the compartments vary from 50°F and 100% humidity during germinating to 200°F and nearly zero humidity during kilning.

To control the process, an electrical system with pneumatic operators is used. Plug-in interchangeable components guarantee uninterrupted operation without "standby" maintenance personnel. Should component failure occur, simple exchange of units at face of control board puts control system back into operation.

Each of the five malting-kilning compartments is equipped with three sets of electrical resistor bulbs suspended into the malt beds. Each set consists of two bulbs, one about two feet above the other, with lower element approximately

(*Continued on page* 82)

HYTAFILL® X-RAY MONITOR *a proved G. E. X-Ray product to make your products better*

"Paid for itself in 5½ months!"

Baby food manufacturer intercepts "leakers"—saves time and cost of 21-day incubation, extra inspections

IN marketing baby food, a spoiled product just *cannot* be allowed to reach the "consumer." That's why Baker Laboratories, East Troy, Wis., formerly held their cans of modified milk for a 21-day "incubation" period, performed two visual inspections.

Since the installation of a General Electric Hytafill, cans are placed directly in cartons with no re-inspection. "Leakers" are rejected automatically because the high-speed x-ray monitor can detect under- and overfills at rates up to 900 containers per minute. Although Baker processes only 250 cans per minute, Plant Manager C. R. Johnson says, "G-E Hytafill paid for itself in 5½ months . . . we can't afford to be without it."

If you're packaging liquids or free-flowing solids in opaque containers, it will pay you to investigate Hytafill's money-saving economy and good-will protection. Ask your G-E x-ray representative for facts, or write X-Ray Department, General Electric Company, Milwaukee 1, Wisconsin, for Pub. BC-74.

Progress Is Our Most Important Product

GENERAL ELECTRIC

When inquiring check 4892 opposite last page

BYE BYE BACTERIA

Taylor CLEANLINER* Thermometers are easier to keep clean! One-piece stem construction eliminates bacteria-harboring cracks, crevices and joints. Housings hermetically sealed. Pyrex glass withstands direct steam in sterilizing. Exclusive BINOC* Tubing is easier to read, too. Wide variety of models and stem lengths available for *every* requirement. Ask your supplier, or write for **Bulletin 98276.**

Taylor Instrument Companies,
Rochester, N. Y., or Toronto, Canada.

*Reg. U.S. Pat. Off.

Taylor Instruments MEAN ACCURACY FIRST

When inquiring check 4892A opposite last page

Does your present timekeeping system provide complete evidence that you comply with the Wage Hour law? Does it prevent time losses from tardiness and excessive time outs? A Lathem Time Recorder solves both problems... inexpensively... quickly. In fact, fast enough to pay for itself in a few months. Send this coupon for complete details, brochures and prices.

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LATHEM TIME RECORDER CO.
86 Third St., N.W., Atlanta, Ga.
Gentlemen: I'm interested in accurate records. At no obligation to me, send me information on Lathem Time Recorder prices and a catalog.
Name_____
Address_____
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When inquiring check 4893 opposite last page

Marshall Canning achieves excellent uniformity of its cream style corn, using modified viscometer for

reproducible consistency of suspension with large

RALPH GOODALE,
Food Technologist
Marshall Canning Co.
as reported by
WALTER KAISER,
Asst. Managing Editor

Modified viscometer used at Marshall Canning

Spindle devised for use in measuring consistency of cream-style corn

Measuring the consistency of cream style corn presents problems, because of the very nature of the product — basically a suspension of corn kernels in a cornstarch solution. The kernels tend to interfere with attempts to obtain a reproducible consistency measurement. In standard viscosity measuring instruments which measure "drag" on rotating spindle immersed in product, spindle will wobble, and readings will fluctuate.

At Marshall Canning Division of Consolidated Food Processors, Inc., located in Hampton, Iowa, canning line control of this consistency has become rigid, though simple, thanks to use of specially-modified viscometer. A tailor-made spindle, used with standard instrument, provides means of holding consistency variation to within $\pm 1\%$.

Rigid control of consistency is an important factor in processing cream-style corn, principally because this consistency tends to increase with storage. Initial consistency must be adjusted (by adding water) to compensate for this fact, but of course cannot be over-compensated, in order to maintain a high-quality product.

The instrument used at Marshall employs a beryllium-copper spring between the driven shaft (spindle) and driving shaft. In operation, the driven shaft lags the driving shaft by an angle proportional to the drag on the spindle, which in turn is proportional to the viscosity of the fluid. Amount of lag is transmitted to 0-100 scale on instrument. Reading can be translated to viscosity by use of simple conversion factors, but at Marshall is used directly by comparing with initial calibration.

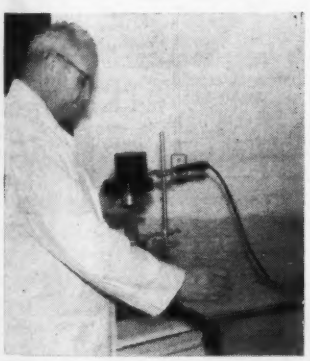
Spindle was specially-developed by manufacturer for cream-style corn. Sawtooth design (see photo) enables spindle to hit enough kernels to provide steady torque reading, while churning material sufficiently so that no "channeling" occurs. Result reflects effect of both kernels and suspending medium.

At Marshall, line samples are drawn every 15 minutes from can filler, and tested with instrument. Deviation of one scale unit or more is cause for

measurement particles

Consistency or viscosity?

Viscosity is usually defined as a fluid's resistance to deformation when subjected to a shear stress — or its resistance to internal friction. For Newtonian fluids, consistency is constant, since this deformation is proportional to the stress. The two terms "consistency" and "viscosity" are interchangeable when applied to these fluids. With non-Newtonian fluids, however, deformation does not change in the same proportion as shear stress, and the term "consistency" is generally used to indicate their "plastic viscosity".



Ralph Goodale, Marshall technologist, takes reading on ring stand-mounted viscometer

adjusting line-mounted consistency controller, which regulates addition of water to the product. Samples of final canned product are also tested several times each day.

(Viscometer, with special spindle, was supplied by Brookfield Engrg. Labs., Dept. FP, Stoughton, Mass. . . . or for more information check 4894 on form which is located opposite last page.)

NOW...
you can make
MOISTURE TESTS IN MINUTES
with the fully automatic
IR MOISTURE -MATIC BALANCE
Tests anything that can be oven-dried... just load...set time and heat...and let the instrument do the rest.
ALL the operator has to do is load the pan and set the timer and heat control to get quick, accurate, permanently recorded moisture readings of granular solids, pastes, liquids, waxes or anything else that can be dried by heat.
The portable IR Moisture-Matic, a product of Moore-Milford Corporation, utilizes *far* infrared for highest absorption and rapid, even heating, and has both a self-contained timer and variable heat control between 30 and 600 watts. The motor driven torsion balance automatically weighs the sample after the test, and the moisture percent is retained on a 3 digit counter to the nearest 0.1 percent. Operates on 115-volts, 60 cycles AC.
All components are of instrument quality to assure long life without maintenance expense. For guaranteed accuracy and speed in your moisture testing, ask your Scientific Products representative for a demonstration or write us today.
IR Moisture-Matic Balance complete, ready for use...
$325.00
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Scientific Products—a single source for all laboratory supplies and equipment—offers a complete selection of moisture testers for every application.
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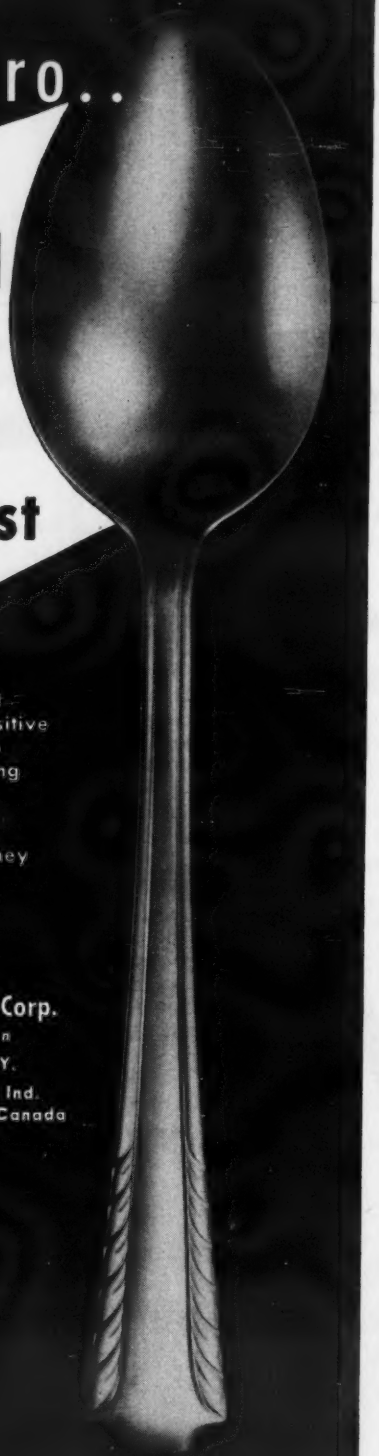
When inquiring check 4895 opposite last page

Nerco-Niro..

..spray-dried Foods meet the taste test



Gentle drying does it. Efficient, economical dewatering without affecting the flavor of heat-sensitive foods. No hot metal surfaces to scorch or burn the material being processed—in a Nerco-Niro Spray Dryer.

Call in one of our engineers. They will be glad to show you the benefits of Nerco-Niro design.

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Nerco-Niro Spray Dryer Division
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1637 N. Illinois St., Indianapolis 2, Ind.
1477 Sherbrooke St. W., Montreal 25, Canada

When inquiring check 4896 opposite last page

instrumentation

Temperature Controller

(*Continued from page 79*)

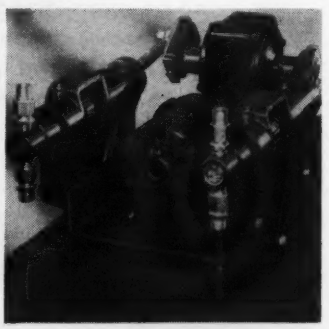
six inches above compartment floor. Electrical control signal from each thermometer automatically controls bed temperature throughout each compartment. Entire operation is controlled by push-button from central electronically operated control panel.

(Autronic control system was supplied by Swartwout Co., Dept. FP, 18511 Euclid Ave., Cleveland 12, Ohio . . . or check 4897 opposite last page.)

High-accuracy proportion easy to maintain

Equipped with micrometer stroke-length adjustment

Features: Plug-in reagent end and other mechanical components are readily accessible for servicing. Vane-guide check valves (with reversible seats) and minimum clearance volume cylinders of self-purging design contribute to accuracy.



Proportions feed over range of 0.8 — 900 gph

Description: Standard models are equipped with micrometer stroke-length adjustment, with in-motion rate adjustment available, if desired. Feed rates range from 0.8 to 900 gph and discharge pressures to 1340 psig.

(Model 1140 proportioning pump is available from Proportioneers, Inc., — Div. of B-I-F Industries, Inc., Dept. FP, 345 Harris Ave., Providence, R.I. Check 4898.)

Highly accurate

MOISTURE ANALYSIS

in a few minutes

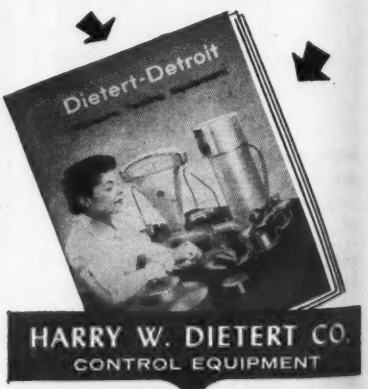
DIETERT-DETROIT MOISTURE TELLERS

Quickly determine the amount of moisture in any material . . . solid granular, liquid or semi-liquid. Control raw material costs. Control quality and costs in the processing of foodstuffs, fibres, tobacco, chemicals, soaps, and many other materials. Easily operated without involved computations!

12 PAGE CATALOG

CATALOG NUMBER SL-1 sent without obligation. Lists various models to suit material to be tested for moisture. Includes data on Dietert-Detroit drying ovens, speed desiccators, etc.

on request



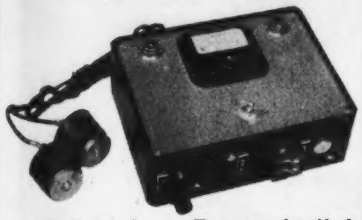
HARRY W. DIETERT CO.
CONTROL EQUIPMENT
9330 ROSELAWN DETROIT 4, MICH.

Send me Moisture Testing Catalog SL-1
NAME_____
COMPANY_____
ADDRESS_____
CITY_____ STATE_____

When inquiring check 4899 opposite last page

Control...

DETERGENT CONCENTRATION IN AUTOMATIC DISHWASHERS



...Reliably!...Economically!
...Automatically!

Take the guesswork out of dishwashing ... control detergent concentration economically and automatically with Industrial Instruments Detergent Controllers. Designed to fit into your present automatic dishwashing equipment, these controllers will allow any predetermined strength of detergent to be maintained with utmost dependability.

RGC-8 New, Low-Cost Controller! Non-electronic unit that does not depend on vacuum tubes or transistors makes possible a completely reliable instrument at an economical price. Operated by means of a pair of electrodes installed in the solution, the controller automatically opens the solenoid valve and feeds additional detergent as required when concentration falls below preset minimum.

INEXPENSIVE INSTALLATION COST ... the RGC-8 Controller comes equipped with UL approved 24-volt BX box-mounting transformer. Wiring from transformer to controller and solenoid valve may be low-voltage wiring. Indicating meter provides solution strength readings. Green lamp indicates instrument in operation, red lamp lights when detergent is being added. Four types of conductivity cells are available from Industrial Instruments for use with the RGC-8. List Price . . . . $85.00 (less cells and solenoid valves).

Other models available. Write for full details on the complete line of Automatic Controllers manufactured by ...

DEALER INQUIRIES INVITED

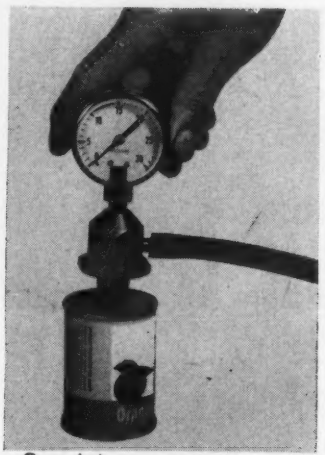
Industrial Instruments Inc.
89 Commerce Road Cedar Grove, Essex County, N. J.

When inquiring check 4900 opposite last page

Improved can vacuum gage lets in less air

Newly developed can vacuum gage operates on principle of balancing vacuum in can with external vacuum source, controlled by self-actuating diaphragm. Diaphragm is integral part of device.

Gage is considered more accurate than previous types, since only small amount of air is introduced into can headspace. Cleaning is also easier since less air is drawn into gage, and diaphragm protects bourdon tube.



Gage balances can vacuum with external vacuum

(Doudera-Seaman vacuum gage is manufactured by Wilkens-Anderson Co., Dept. FP, 4525 W. Division St., Chicago 51, Ill. . . . or for more information check 4901 on the convenient Reader Service slip opposite last page.)

"There's some discrepancy in the Specific Gravity."

Emery NEWS

WEIGHING SYSTEMS

BIN, TANK AND HOPPER EDITION No. 5

Covering design, development and application data on Emery Weighing Systems for industrial applications.

TOP EXECUTIVES FIND EMERY WEIGHING SYSTEMS SUITABLE FOR TOUGHEST WEIGHING APPLICATIONS IN PROCESSING FIELD

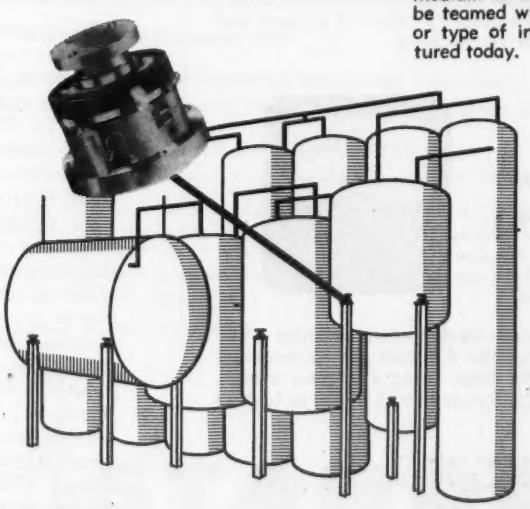
Vision And Experience Team Up To Decide On Maintenance-Free Hydraulic Equipment

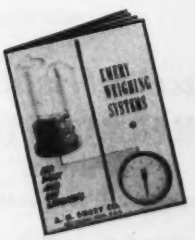
Men with progressive vision and broad experience in the processing industries are becoming increasingly aware of the need for positive action, extreme accuracy and maintenance-free long service life in the control equipment they buy for their plants. Why? Because in these days of tough "break-even" points and narrow profit margins, they can't afford to take chances.

They know, as well as you do, that laboratory-type apparatus which "needs to be babied" . . . or a weighing system which needs its own electronic engineer . . . just will not stand up under countless hours of rough industrial usage.

The Emery Load cell is a "husky" piece of industrial equipment which combines years of satisfactory performance with amazing accuracy. A unique design called the "rolling ball" head accommodates reasonable off-center and cross loads. Even though Emery Load Cells utilize hydraulic pressure as a sensitive medium to measure loading they can be teamed with practically any brand or type of instrumentation manufactured today.

There are many good reasons why top executives are specifying Emery Load Cells for their bin, tank and hopper weighing applications. Our new Bulletin 561 describes them in detail. Send for this literature today.





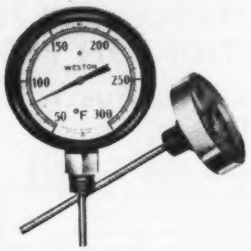
A practical handbook on bin, tank and hopper weighing and the instrumentation involved. Write for it now!

PRECISION SINCE 1872

THE A. H. EMERY COMPANY
Pine Street • New Canaan, Conn.

When inquiring check 4902 opposite last page

3 WAYS TO MEASURE TEMPERATURE



bi-metal
THERMOMETERS
for industrial and "built-in" needs

Overwhelmingly preferred because of their all-metal ruggedness, stability and long life. In heavy duty types, straight and angle forms, 6" and 5" dia heads – industrial types, angle form, 3" and 2" heads; stainless steel stems, lengths from 2½" to 24". Ranges low as – 100 F to high as 1000 F; accuracy 1% of range.

filled system
THERMOMETERS
for remote readings– alarms

Available with mercury, liquid, gas filled, or vapor pressure actuations in 5", 6" and 8" dial sizes – for wall or flush mounting. Models to indicate as low as – 325 F or as high as 1000 F. Available with adjustable electrical contact and index pointer for signal or alarm needs.

electrical resistance
THERMOMETERS
for remote and multiple readings

Resistor bulb permits remote temperature readings – and by use of several bulbs, several different remote temperature measurements can be made using a selector switch. Accuracy 1% of full scale. Range low as – 100 to high as 500 F.

For literature write . . .
Weston Electrical Instrument Corp., Newark 12, N. J.

WESTON A DAYSTROM UNIT
THERMOMETERS

When inquiring check 4903 opposite last page

Moisture determined in seconds

Lab technician is shown checking moisture of marshmallows, using special accessory electrodes supplied for the purpose

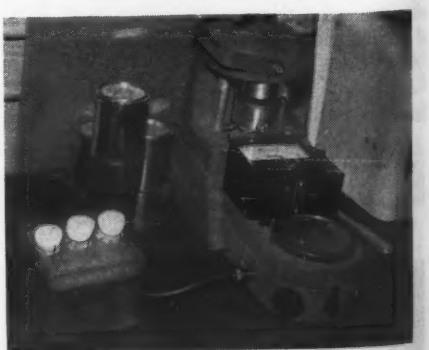
starch, popcorn, peanuts, marshmallows — ranging from 4 to 22% moisture

WILLIAM HOLTZ, Chemist Cracker Jack Company
as reported by **WALTER KAISER** Asst. Managing Editor

Elimination of lengthy and sometimes intricate oven-method moisture tests even for low moisture materials such as starch, is being achieved at Cracker Jack Company in Chicago by means of a new development in electrical moisture testing. Instrument utilizes modified electrical conductivity principle and is equipped with stable amplifying circuits for the low moisture products. It is used without these circuits for higher moisture.

Quick moisture checks of molding starch are important in candy processing because the starch is recycled after it's used. The moisture must be controlled closely, since slight changes alter texture appreciably. The oven moisture method for starch is time consuming and requires exacting technique of experienced personnel. With the new tester, even an inexperienced operator can make a determination in less than a minute. Correlation with oven tests is excellent (see chart).

Instrument is used in three different ways. Moist granular samples such as peanuts or popcorn are placed in sample cup under high pressure and measured by standard range circuit. Dry granular products, such as starch, are similarly compressed in sample cup but are measured with the amplifying circuits operated by separate controls at bottom of instrument. Thirdly, accessory electrodes are used to test semi-solids such as marshmallows (see photo).



Controls around base of tester are for amplifying circuit, making measurement of low moistures possible

outer scale, eliminating need for conversion charts.

Sample is compressed to predetermined thickness, as registered on micrometer gage —different settings are used for different products. Current is supplied by self-contained battery. Built-in thermometer facilitates measurement of temperature while sample is under compression.

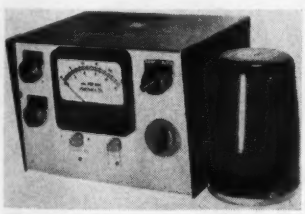
(Model AA Moisture Tester is product of Moore-Milford Corp., Dept. FP, 1316 Sherman Ave., Evanston, Ill. . . . or for more information check 4904 opposite last page.)

Flow blender-proportioner operates remotely

Electronic unit adaptable to most existing systems

Uses: Continuous flow blending and proportioning.

Features: Electronic controller can be located several thousand feet from process, avoiding necessity of piping materials to control station. Unit is designed to be adapted



Controller operates on plant light circuit

to proportioning systems now in operation, since it takes electrical signals from most flow transmitters, and valve control can be installed on stems of most valves.

Description: Complete system consists of transmitting flow rate meter, electronic controller, and electronically-operated metering valve.

(Blendtrol flow blender and proportioner is product of Jordan Co., Inc., Dept. FP, 3235 W. Hampton Ave., Milwaukee 9, Wis. . . . or for more information reader may simply check 4905 on form opposite last page.)

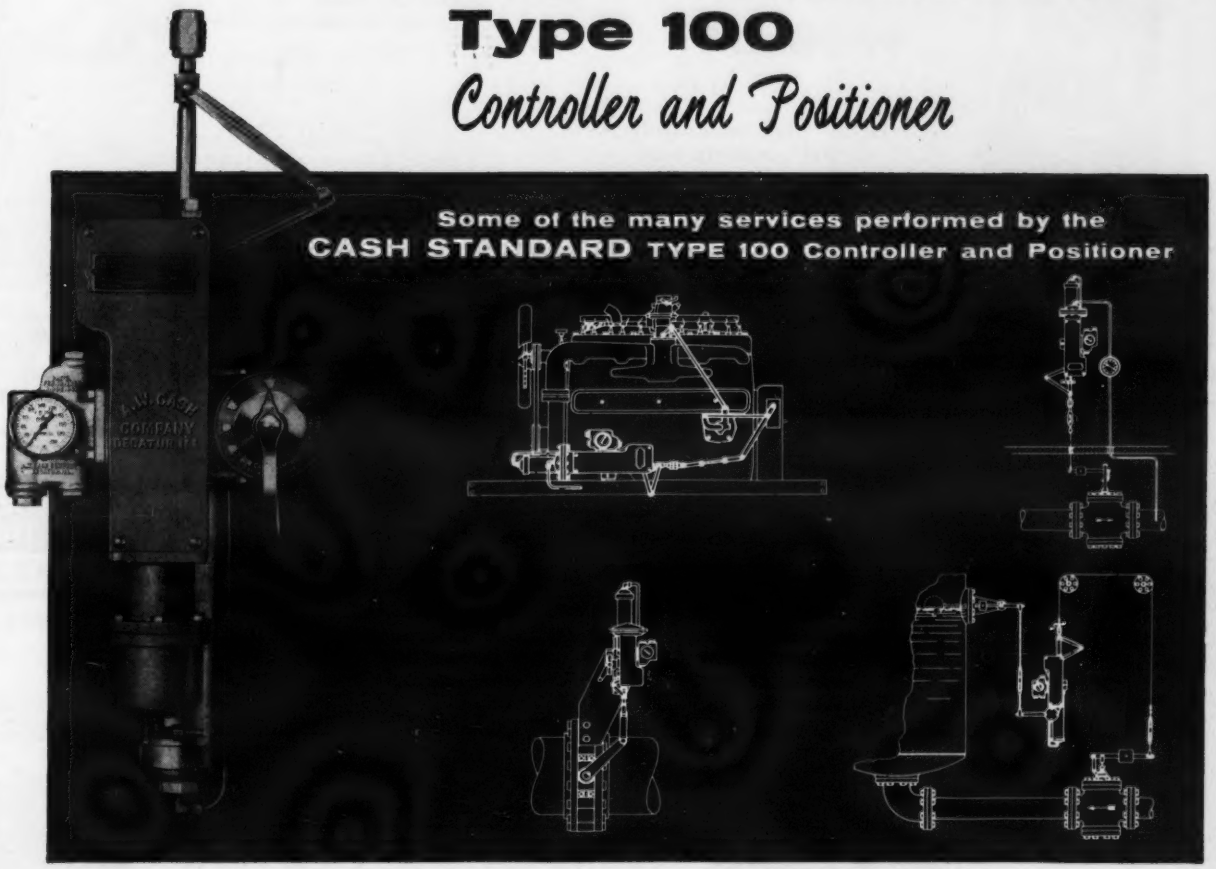
automatic control or positioning problem?

Here's the answer . . . the versatile

CASH STANDARD

Type 100

Controller and Positioner



Include this unit in your process system as:

1. A controller with self-contained positioning mechanism.
2. A power positioner actuated by a signal from another controller.

The Type 100 coupled with various types of final control elements will accurately control:
• Pressure • Liquid level • Rate of flow • Other process variables

The Type 100 features: • Feed back type control • Adjustable range • High sensitivity • Linear or curved line characteristics • Reverse or direct action • Optional manual control • Double acting cylinders, 6" or 12" stroke, 2", 2¾" or 4" bore for operating pressures up to 125 psi. (Also suitable for larger cylinders in combination with volume booster when higher thrusts are desired.) • Operation by air, oil or clean water.

Available for these signal ranges: • Vacuum • Differential pressure • Pressures up to 600 psig. • Lever motion

WRITE TODAY for complete information, including literature, on this versatile instrument. Dept. K.

CASH STANDARD

A. W. CASH COMPANY, P. O. Box 551, Decatur, Illinois

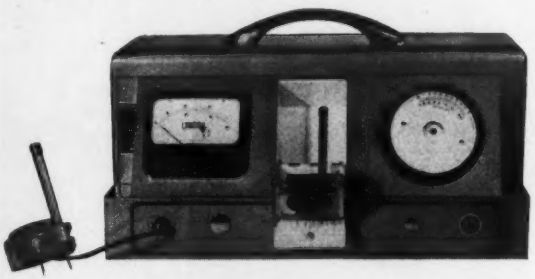
Pressure, Hydraulic, Temperature, Process and Combustion Controls

When inquiring check 4906 opposite last page

DO YOU HAVE A LOW MOISTURE PROBLEM?

Here's the most truly "Universal" moisture tester being sold today. Can test all standard materials plus "difficult" dry products as starch and saltine crackers in 30 seconds . . . and even has facilities for probe testing semi-solids or semi-liquids.

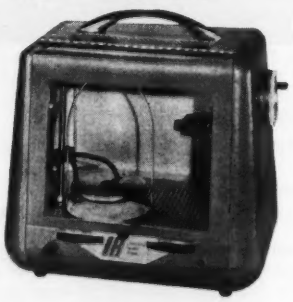
Available in 4 different models to cover extremely wide moisture range. Write today for full information.



ELECTROPROBE

30 second testing of semi-liquid and semi-solid formulated products either cold or during cooking cycle.

***I-R MOISTURE-MATIC BALANCE**



Dries, times, weighs and records moisture percent all automatically. For any product that can be dried by heat.

*Infrared

A moisture tester for any and every purpose—batch testing or continuous recording and regulating.
Your inquiry invited.

CORPORATION MM

MOORE-MILFORD CORPORATION

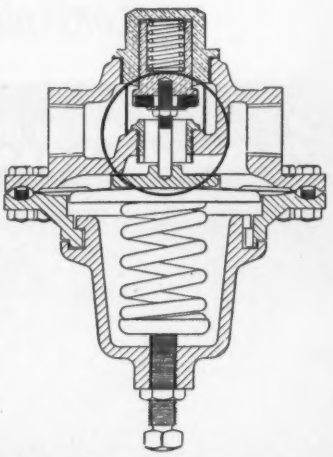
Manufacturers • Engineers • Consultants

1316 Sherman Avenue • DAvis 8-7168 • Evanston, Illinois

When inquiring check 4908 opposite last page

Pressure regulator has interchangeable discs

Features: User can easily switch from one service to another, such as water to steam, gas, or air, by merely interchanging valve discs.



Large through-passage provides less turbulent flow

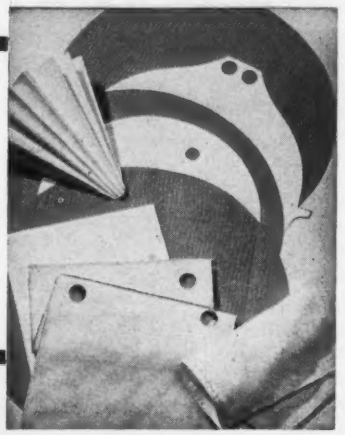
Description: High capacity unit has reduced pressure range from 1 to 100 psi, depending on valve size, with initial pressure as high as 400 psi. Available in bronze, semi-steel, or steel, in sizes ⅜" to 2".

(Pressure regulator is manufactured by Davis Regulator Co., Dept. FP, 2527 S. Washtenaw Ave., Chicago 8, Ill. . . . or check 4909 opp. last page.)

"Bought everything in this room with Fred's cigarette coupons."

FILPACO FILTER MATERIALS

Will help YOU with your particular filter requirements



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- **FILTER CLOTH** cotton, wool felt, glass, Orlon, Nylon, silk, Vinyon, Saran and other synthetics cut and sewn to required shapes and sizes . . . variety of weaves, weights, finishes.

We invite your inquiries

FILPACO 25 YEARS OF QUALITY-SERVICE 1932 1957

FILPACO INDUSTRIES
The FILTER PAPER CO.
2436 S. Michigan Avenue, Chicago 16, Illinois

When inquiring check 4910 opposite last page

MAISCH METERING PUMPS

- STAINLESS STEEL — OILLESS BEARINGS — STERILIZABLE
- POSITIVE DISPLACEMENT — SMOOTH, NON-PULSATING FLOW
- FOR HOT, COLD, VISCOUS OR WATERY FLUIDS
- ACCURATE WITHIN 1 TO 2%

Maisch Metering Pumps are simple in design, ruggedly built for long service, and can be depended on to maintain accuracy indefinitely. Exclusive design features insure optimum performance. Particularly suited for handling chemicals, syrups, oils, glue, processing solutions, etc. Quick demountable or fixed heads. Fixed capacity pumps available in wide range of output. Pumps in stock for immediate delivery. Write for complete details and prices.

MECHANICAL PRODUCTS CORPORATION
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When inquiring check 4911 opposite last page

THE BIG NEWS

In Blends, Emulsions, Dispersions

GAULIN

"Particle Control"

Look what Gaulin *Particle Control* can do for your product . . .

- Improve texture, make a finer, more uniformly stable emulsion.
- Accent taste, scent and color. Lock in subtle flavors and fragrance against evaporation.
- Keep it always good to look at by stopping separation — no more "shake well before using"!

How about your product?
Chances are a Gaulin Homogenizer can help improve some food, beverage or chemical you make. Try this dramatic new approach to blending with a Laboratory Homogenizer for only $75.00 a month.

Homogenizers and Sub-Micron Dispersers Ask for Bulletins H-55 and SMD-55.

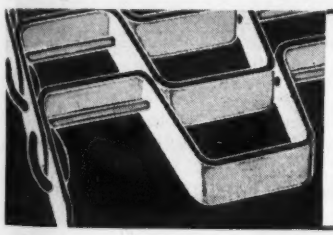
The G.T.A. Library of Product Information

Ask for G. T. A. — Gaulin Technical Assistance — for experienced advice and factual data on the best method to mix or move your product. Complete research and test facilities to help you. Write for FREE booklets to get you started. Manton-Gaulin Manufacturing Co., Inc., 59 Garden St., Everett 49, Mass.

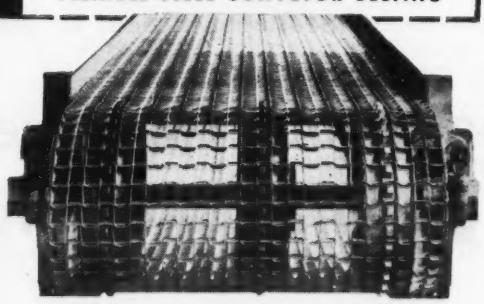
Gaulin

MGM-14

When inquiring check 4912 opposite last page



Engineered
for EVERY Process
LA PORTE
FLEXIBLE STEEL CONVEYOR BELTING



Food moves smoothly through freezing, cooking and dehydrating processes on this all-process conveyor belting that costs less, wears longer, and requires less maintenance.

The open-mesh construction assures a positive drive on the sprocket, provides for fast drainage, permits free circulations of air around products in process, prevents waste accumulation, protects your products against odors and off flavors, and makes sterilizing with a steam gun or scalding water simple and easy.

If you process, package, ship, or store food products this is the belt for you. Available in ½" x 1" also 1" x 1" in any length and practically any width.

LA PORTE

Ask your Mill Supplier or write for illustrated literature, prices.

MAT AND MFG. CO.
BOX 124 Dept. A *La Porte, Indiana*

When inquiring check 4913 opposite last page

Temp controller changed from direct to reverse acting without tools

Mercury-actuated, air-operated indicating temperature controller is made in two basic types — "on-off" and "proportional band". Unit can be changed from direct to reverse acting — or vice versa — without tools.

Unit is made in both "on-off" and "proportional band" models

Instrument is wall mounted, with standard ranges up to 800°F. Recording units are also available.

(Indicating temperature controller is product of H. O. Trerice Co., Dept. FP, 1420 W. Lafayette Blvd., Detroit 26, Mich. . . . or check 4914 opposite last page.)

Aerosol refrigerant ferrets out hot components

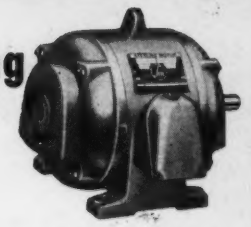
Faulty electronic circuit components which work satisfactorily when cold, but fail when overheated can be detected by aerosol refrigerant. Nonflammable refrigerant chills anything it touches.

Suspected components are sprayed, one at a time, until frost forms. If circuit then operates satisfactorily, sprayed part at that time is likely to be faulty member. Capacitors, resistors, transistors, and others can all be tested this way.

(Jiffy Zero Spray is product of Arco Electronics, Inc., Dept. FP, 111 S. Vermont Ave., Los Angeles 4, Calif. Check 4915 opposite last page.)

Win the Race
OF PRODUCTION TECHNOLOGY

Sterling
ELECTRIC POWER DRIVES



Electric Power Drive Systems are important factors in determining the productivity and flexibility of any manufacturing process. To help you successfully compete with the trend toward mechanization and automation, Sterling offers a wide range of power transmission equipment—variable speed or constant speed—with manual or automatic controls. These products, plus Sterling's Application Engineering Service, give your machinery the type of drive system that assures versatility and maximum productivity at lower cost.

Sterling Speed-Trol Variable Speed Motors
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Sterling Constant Normal Speed Motors
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Write today for Bulletin No. 185. Discover the big advantages Sterling Electric Power Drives can bring to your plant.

STERLING
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LOS ANGELES 22 · CHICAGO 35
CINCINNATI 37 · NEW YORK 51

When inquiring check 4916 opposite last page

New TEMPERATURE RECORDER...

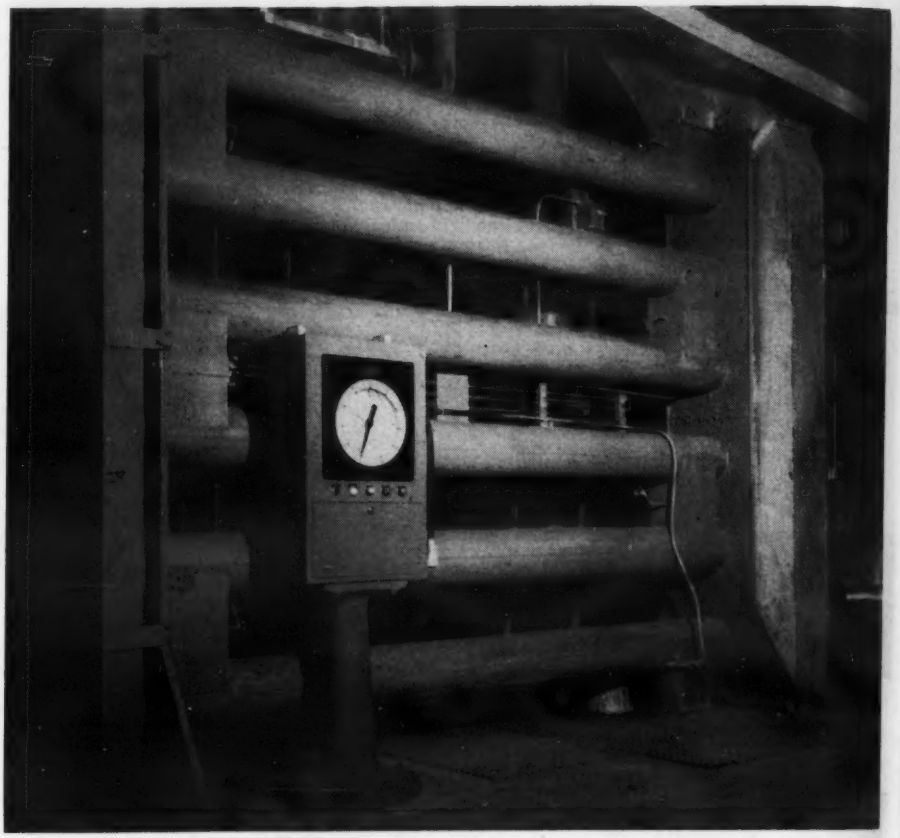
AUTO-LITE

Available with 24-hour or 7-day electric or mechanical chart drive.

Model 1000 is the latest addition to the Auto-Lite line of temperature recorders and indicators. It has evenly calibrated, 6-inch chart . . . attractive die-cast case. Various standard chart ranges from minus 40°F. to plus 550°F. The style illustrated is portable type, with capillary tubing. Also available for mounting on panel boards or walls. Obtainable with a cycle indicator for refrigeration. Priced from $49.50. Write for further information.

THE ELECTRIC AUTO-LITE COMPANY
INSTRUMENT AND GAUGE DIVISION
TOLEDO 1, OHIO
NEW YORK CHICAGO SARNIA, ONTARIO

When inquiring check 4917 opposite last page



Multi-pass conveyor-mixer for cottonseed meats has moisture control panel mounted in front

Cottonseed processors use electrical conductivity measuring system to assure

Continuous moisture control of granular solids within ± 1%

WILLIAM J. SCARLETT,
Food Industry Manager
Industrial Division
Minneapolis-Honeywell Regulator Co.

Based on paper presented at 17th Annual Meeting of Institute of Food Technologists

PROCESSING of cottonseed — to obtain both the oil and the meal — involves the addition of proper amount of water, cooking to break down cell structure, and crushing to expel oil content. Moisture content of the initial uncooked mixture is of great importance, because when it is not properly adjusted yield of oil is poor, excess oil remains in the meal, and processing equipment operates at reduced throughput and reduced efficiency. Moisture content must be confined within a narrow range if operation is to be efficient.

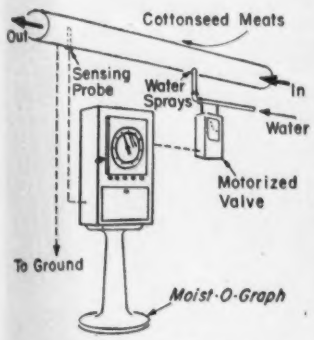
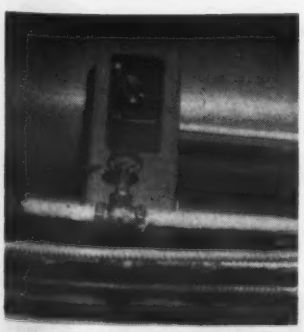


Diagram indicates operation of moisture control system

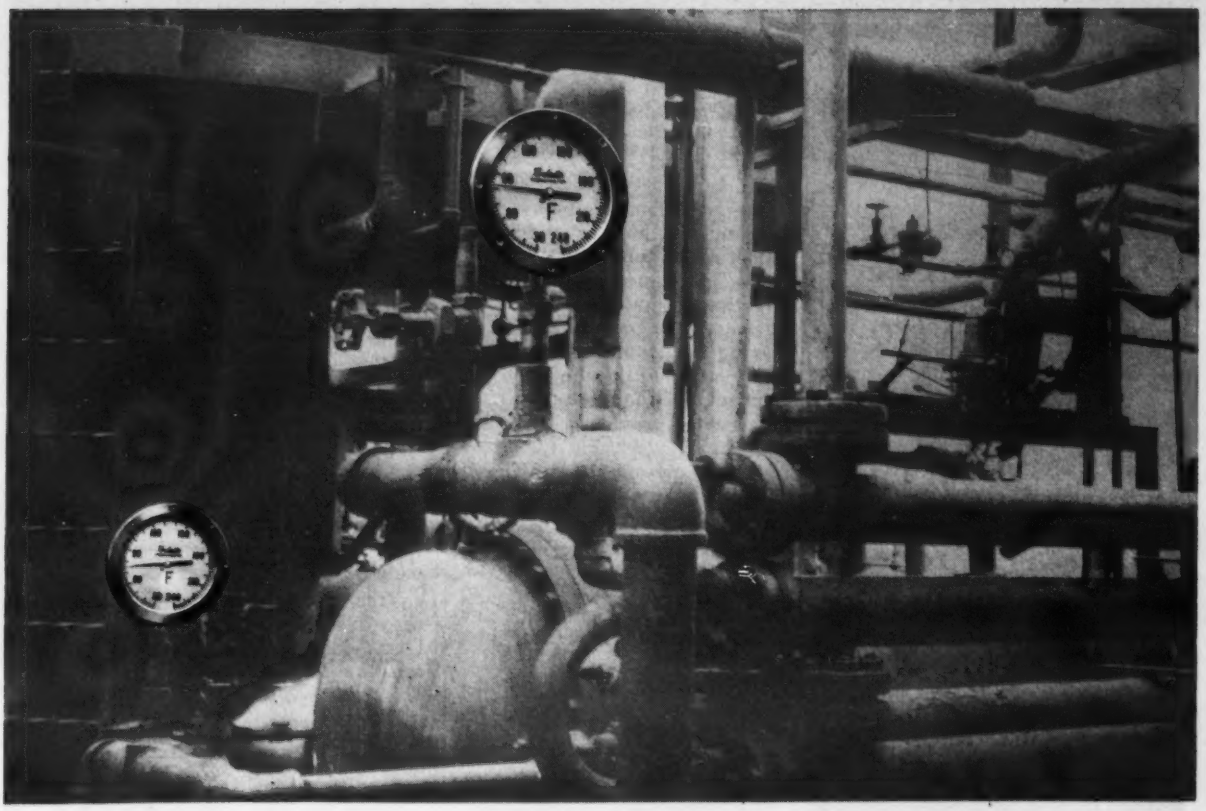
Control of this moisture content to within ±1% has been achieved by prominent cottonseed processors, through use of an automatic control system, based on continuous measurement of electrical conductivity of the wetted mass.

In the process, the cottonseed meats are conveyed enroute to cookers and expellers through a multipass screw conveyor. In the first and second passes of the conveyor, the meats are subjected to a water spray. Subsequent conveying is for double purpose of mixing, so that all of the product is wetted, and to provide necessary time interval for water adsorption by the seed meats. The moisture adding device was especially designed in the plant for the purpose and is supplied with a constant flow of product.

(*Continued on next page*)



Close-up shows automatically-controlled motorized valve for adding water to cottonseed meats



There's an RMC thermometer for almost every industrial requirement

Dial sizes from 1″ to 5″, stem lengths from 2½″ to 70″, scale ranges from −150° F to +1000° F. These figures represent *only* Rochester Manufacturing Company's *standard* thermometer specification limits. There is practically no limit to what RMC can do in the way of *special* thermometer applications.

Standard or special, *all* RMC thermometers are made of corrosive-resistant stainless steel, have hermetically sealed non-fogging dial chambers, are available with RMC's exclusive external recalibration device, and are guaranteed accurate to 1% of scale range. Why not remove temperature indication problems from your unsolved list—turn them over to RMC.

Look to RMC for Full-Line Instrumentation— for manufacturers and users of processing equipment—and many consumer products.

DIAL THERMOMETERS

PRESSURE SWITCHES

PRESSURE GAUGES

LIQUID LEVEL GAUGES

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Tell us your requirements for direct mounting and remote indicating instruments, and let RMC Engineering skill provide the answers!

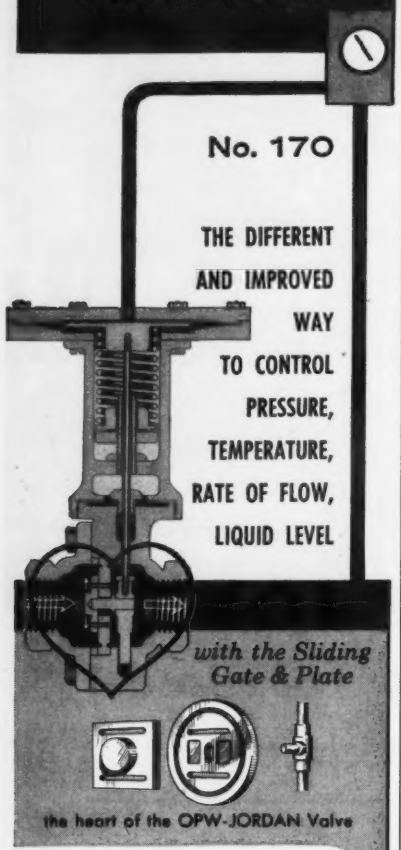
RMC

LIQUID LEVEL · TEMPERATURE and PRESSURE INSTRUMENTS

ROCHESTER MANUFACTURING CO., INC. • Rockwood Street, Rochester 10, N. Y.

When inquiring check 4918 opposite last page

OPW-JORDAN
diaphragm
motor valve



No. 170

THE DIFFERENT AND IMPROVED WAY TO CONTROL PRESSURE, TEMPERATURE, RATE OF FLOW, LIQUID LEVEL

with the Sliding Gate & Plate

the heart of the OPW-JORDAN Valve

- POSITIVE, DEAD END SHUT-OFF
- PRECISE, ACCURATE CONTROL
- WIDE RANGEABILITY
- SELF CONTAINED OR CONTROLLER OPERATED

The No. 170 Diaphragm Motor Valve, incorporating the use of OPW-Jordan's unique Sliding Gate, offers straight through flow, with modulation through the valve opening. Seating surfaces of hardened stainless steel, precision lapped to light band flatness tolerances insure a positive leakproof shut-off. Wire drawing minimized or eliminated. Compact, space-saving, the No. 170 offers the full advantage of accurate control and desired sensitivity. Durably constructed for hard continuous usage, the basic design and exclusive features of this valve make it outlast and outperform ordinary diaphragm motor control valves.

Free Bulletin J-170 gives complete details, flow curve and capacity tables.

OPW

JORDAN CORPORATION
DIVISION OF OPW CORP.
6013 Wiehe Road
Cincinnati 13, Ohio
ELmhurst 1-1352

When inquiring check 4919 opposite last page

Moisture Control

(*Continued from preceding page*)

Flights of the screws are a maximum 9" in diameter and are encased in a 10" diameter sheet metal tube so that there is ½" clearance between motivating screw and housing.

This arrangement of moistening equipment is particularly adapted to the type of control applied because it inherently provides conditions which are desirable for conductivity measurements. These conditions require a uniform flow of product past the moisture-adding spray nozzles, and similarly past the sensing probes. The conveyor, also by its nature, will compact the product with a reasonably uniform degree of effect.

The sensing probe is mounted at the outlet end of the final pass of the conveyor. The probe itself is an insulated conductor which carries a small electrical current into the product. The shell of the conveyor is grounded to complete an electrical circuit. Amount of resistance will depend on how much moisture is present. A controlling instrument measures the amount of current flow, and actuates control valve on water pipe line to supply more or less water.

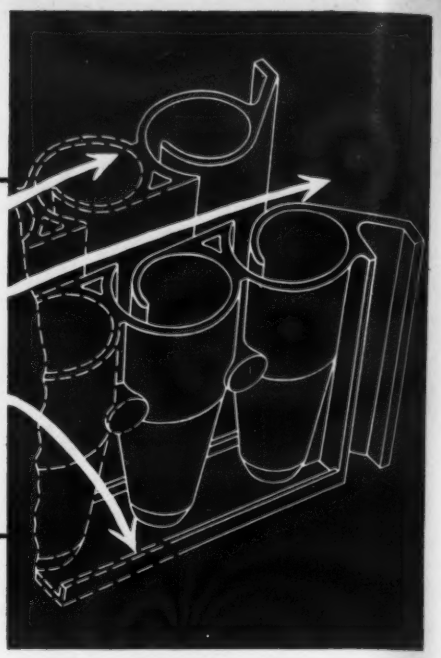
Results are reproducible, and the widest variation as found by careful laboratory moisture determination is a maximum of ±1% when process is on control. This is well within tolerable limits for this operation. Even closer control can be obtained if necessary.

Following this successful installation, management at one plant reasoned that the same system would provide a reliable means of controlling moisture content of finished cottonseed meal. A second installation was then made in the same plant, this time on finished meal. Reports from this installation indicate that accuracy has been held at 0.5%.

(Control system used was supplied by Minneapolis-Honeywell Regulator Co., Industrial Div., Dept. FP, Wayne & Windrim Sts., Philadelphia, Pa. Check 4920 opposite last page.)

New... Improved

MICROCLONE DUST COLLECTOR



NEW *casting process* provides smoother interior finish — "Cling-Free" surface.

NEW *inlet design* assures better distribution of air and material.

NEW *flange design* eliminates all protrusions in dust hopper — meets strictest sanitation requirements.

NEW *seal surface design* assures air-tight operation for highest efficiency.

THESE MAJOR DESIGN IMPROVEMENTS on the widely used and highly regarded "Microclone" M-40-A Dust Collector mean... *higher returns on your investment in food processing equipment.*

WRITE TODAY...
for more information and descriptive literature.

P.O. BOX 2520 **DUSTEX CORP.** BUFFALO 25, N.Y.

When inquiring check 4921 opposite last page

Anderson
DISPENSER-FILLER-CAPPER FOR ½, ¾ OR 1 OZ CUPS

For filling small nesting round plastic or paper cups with jelly, jam, cream, salad dressing, mustard, tarter sauce, catsup, and other similar products.
In one continuous operation Anderson Model 600 dispenses ½, ¾ or 1 oz cups, fills and caps them at speeds from 36 to 75 a minute.
Operation is simple, smooth, quiet. Every cup is filled accurately, uniformly, without waste. You can clean the machine in minutes and change from one product to another. Get full information on this speedy filler.

Write for Bulletin No. 6-45

Anderson
ANDERSON BROS. MFG. CO.
ROCKFORD, ILLINOIS

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can't beat **Model RA**

FOR MEDIUM TO HEAVY MIXING

Stainless steel throughout. Fully sanitary—meets the strictest Health Dept. requirements. Equipped with GROEN-exclusive demountable shaft couplings which cannot disengage in operation, yet permit removal of agitator assembly in a few seconds for easy cleaning. • Large revolving scraper blades maintain movement of contents away from heated walls into baffle. Small blades below prevent settling. Efficiency is positive . . . results dependable. Bulletin RAK-2 gives full, illustrated details. Write for your copy today.

IF YOU need EXTRA-HEAVY mixing ask us about TWIN-SHAFT Model TA.

GROEN MFG. CO. 4535 W. Armitage Ave., Chicago 39 • 30 Church St., New York 7

BULLETIN RAK-2
Gives all the facts and figures. Tells how to get faster, better medium to heavy mixing. Write for this Bulletin now.

Half a Century of Fine Kettles GROEN

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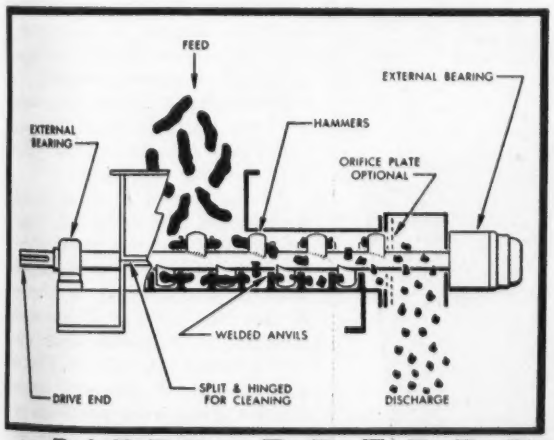
. . . . the answer to many problem jobs in



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of extremely large and/or tough materials

MIXING
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RIETZ PREBREAKERS

Models for Many Purposes

CAPACITIES: ½ to 60 Tons per Hour
MOTORS: 1 HP to 100 HP
SPEEDS: 10 RPM to 600 RPM

Rietz Prebreakers successfully replace equipment of much higher horsepower and function with lower maintenance cost.

Send your problem materials to Rietz for free testing on Rietz equipment. Processed samples and a full report will be returned to you.

ENGINEERING OFFICES IN PRINCIPAL CITIES

Rietz MANUFACTURING CO.
Santa Rosa, Calif. West Chester, Penn.

When inquiring check 4924 opposite last page

Pressure transmitter accurate to ± ½ %

Eccentric indicating scale built into front of transmitter case

Uses: Measures pressures of 0-30" of water to 0-6000 psi. Transmits 3-15 psi air signal to instruments.

Features: Red pointer and black-on-white scale markings are visible at 20'. Universal mounting brackets provide choice of installation method: wall surface or vertical pipe mounting.

Transmitter measures 8-1/8x5-7/8x4-1/8"

Description: Built-in eccentric scale is 4-⅛" long. Output and 20 psi air supply connections are ¼" npsf; measurement connection, ¼ or ½ npt, depending on pressure range. Pressure elements offered: spirals, helicals, bellows, diaphragms. Complete unit weighs 8 lb.

(Model 44 pressure transmitter is built by The Foxboro Co., Dept. FP, Foxboro, Mass. . . . or check 4925 on form opposite last page.)

HAVE YOU NOTICED?

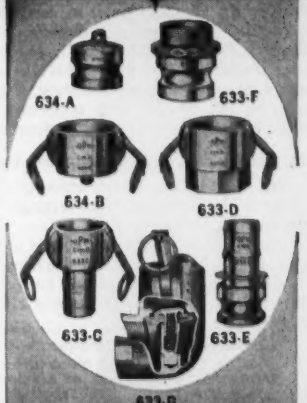
FOOD PROCESSING is now "executive size". Turn to page 6 for the story on this improvement of an original design.

KAMLOK QUICK COUPLERS

OPW CORPORATION CINCINNATI 25, OHIO

SLIPS ON CAM TIGHTENS HOLDS TIGHT NEVER FAILS

The Fastest, Safest, Surest Coupling Known



KAMLOK

BRONZE • ALUMINUM • MONEL
STAINLESS STEEL • SEMI-STEEL

ALL STYLES OF ADAPTORS FIT IN ALL STYLES OF COUPLERS OF THE SAME SIZE.

Perfectly tight, no leak connection in seconds. Kamloks couple and uncouple instantly regardless of "hook-up".

Write for Free Bulletin F-10

JORDAN CORPORATION
Industrial Sales Division of OPW Corporation
6013 Wiehe Rd., Cincinnati 13, Ohio

When inquiring check 4926 opposite last page

Announcing to the Process Industries

An Entirely New Product by Western Precipitation

...The HI-TURBIANT HEATER!

- A Vertical Direct-Fired Heater For Industrial Heating at Elevated Temperatures!
- Ideal For Handling Heat-Sensitive Fluids!
- Brings New Savings to a Wide Range of Modern Heat-Processing Operations!

Backed by the engineering "know-how" and process-equipment experience of Western Precipitation, the Hi-Turbiant Heater system fills a constantly growing need in modern processing operations—a means of heating such heat-transfer fluids as Dowtherm, Aroclor, hydrocarbon oils and similar heat-sensitive fluids. It is also ideal for other applications—steam superheating, Rich-Oil denuding, asphalt heating and processes where fluids must be heated under close thermal control.

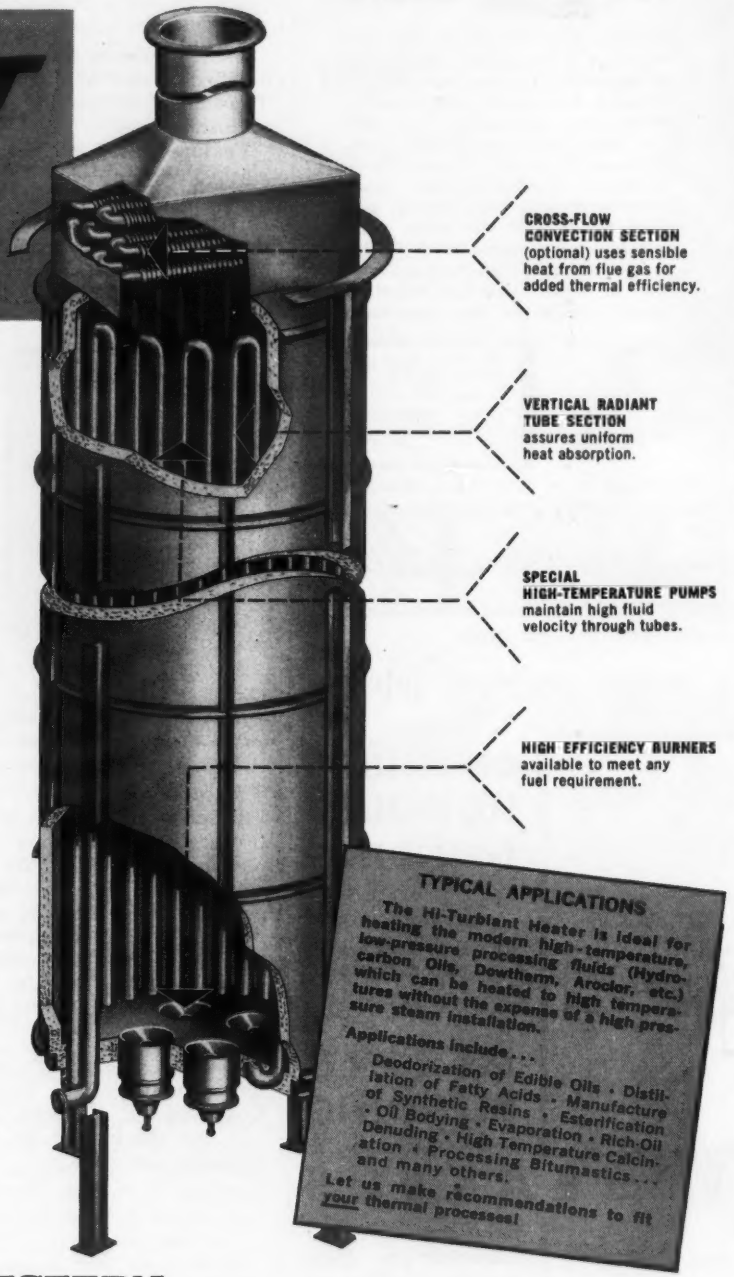
Combines Radiant Heating with High Fluid Turbulence

The Hi-Turbiant Heater consists essentially of a series of "hair-pin" tubes set vertically in a low conductivity refractory setting.

Each radiant tube is exposed to uniform absorption in the cylindrical combustion chamber. A cross-flow integrally mounted finned tube convection section assures high thermal efficiency.

- Forced circulation is provided by specially designed high temperature centrifugal pumps.
- The designed high fluid turbulence permits high fuel efficiencies at maximum operating temperatures for heat-sensitive media.
- Extended surface cross-flow convection section used where maximum thermal efficiency is required, or when a second stream requires moderate heating.
- Burners are available to meet any fuel requirement. Complete combustion controls are provided to integrate the heater with the controlled process.

The Hi-Turbiant Heater system is available in a complete range of sizes from 3 to 40 million BTU/hr—with or without a convection section—to meet a wide variety of applications. If you plan process operations using heat-sensitive fluids, let our engineers explain the many advantages of Hi-Turbiant heating. No obligation, of course!


CROSS-FLOW CONVECTION SECTION (optional) uses sensible heat from flue gas for added thermal efficiency.
VERTICAL RADIANT TUBE SECTION assures uniform heat absorption.
SPECIAL HIGH-TEMPERATURE PUMPS maintain high fluid velocity through tubes.
HIGH EFFICIENCY BURNERS available to meet any fuel requirement.
TYPICAL APPLICATIONS
The Hi-Turbiant Heater is ideal for heating the modern high-temperature, low-pressure processing fluids (Hydrocarbon Oils, Dowtherm, Aroclor, etc.) which can be heated to high temperatures without the expense of a high pressure steam installation.
Applications include...
Deodorization of Edible Oils • Distillation of Fatty Acids • Manufacture of Synthetic Resins • Esterification • Oil Bodying • Evaporation • Rich-Oil Denuding • High Temperature Calcination • Processing Bitumastics... and many others.
Let us make recommendations to fit your thermal processes!

WESTERN PRECIPITATION CORPORATION

Engineers and Constructors of Equipment for Collection of Suspended Material from Gases . . . and Equipment for the Process Industries

LOS ANGELES 54 • NEW YORK 17 • CHICAGO 2 • PITTSBURGH 22 • ATLANTA 5 • SAN FRANCISCO 4

Representatives in all principal cities

Precipitation Company of Canada Ltd., Dominion Square Bldg., Montreal

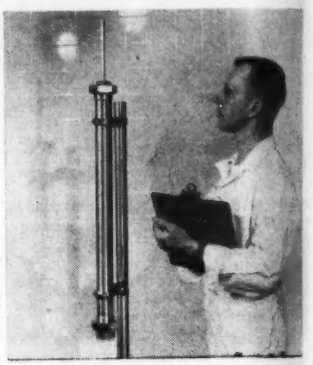
When inquiring check 4927 opposite last page

QUALITY CONTROL

Measures firmness of cottage cheese curd

Helps control cooking to assure uniform product

Uses: For accurately measuring firmness of cottage cheese curd particles during the "cooking" period, and determining the proper time and temperatures for cooking curd to have uniformity of product.



Plunger's penetration indicates curd firmness

Features: Aids greater yields with less danger of shrinkage from over-cooking, and crumbling from under-cooking.

Description: Meter consists of three basic parts: a barrel, calibrated plunger, and a basket; mounts vertically.

As the vat of cooking curd approaches finish point, operator dips out the prescribed amount of curd and, after washing and cooling it, places it in the basket. Calibrated plunger is released and allowed to fall into basket. Force and weight of plunger compresses and forces particles of curd out of perforations of basket in exact proportion to firmness of curd.

(Lundstet cheese curd meter is available from Cherry-Burrell Corp., Dept. FP, 427 W. Randolph St., Chicago, Ill. Check 4928 opp. last page.)

For more information on product at right, specify 4929 . . . see information request blank opposite last page.

Food Industry's finest flavor policy

Atlas Fruit Flavors are available in various strengths and concentrations. They are also available expertly blended with synthetics to insure lasting taste and aroma. Let us suggest the Atlas flavor best suited to your requirements.

FIRST PRODUCERS OF CERTIFIED COLORS

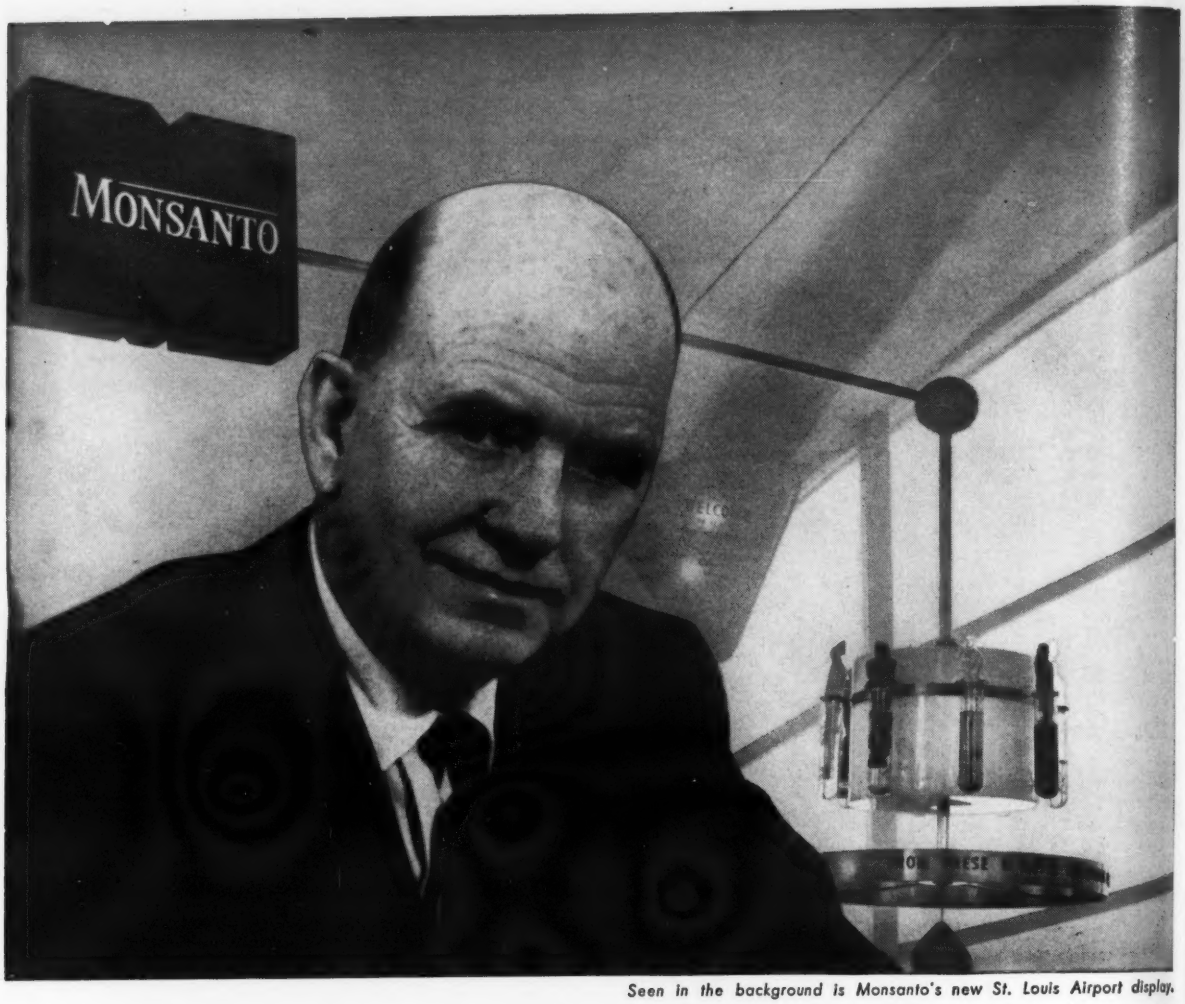
H. KOHNSTAMM & COMPANY Inc.

ESTABLISHED 1851

89 PARK PLACE, NEW YORK 7 • 11-13 E. ILLINOIS ST., CHICAGO 11 • 2632 E. 54 ST., HUNTINGTON PK., CALIF.

BRANCHES IN OTHER PRINCIPAL CITIES OF THE U.S.A. AND THROUGHOUT THE WORLD

E



Seen in the background is Monsanto's new St. Louis Airport display.

"Business Publications help us keep tuned to our markets"

says CHARLES ALLEN THOMAS, President, MONSANTO CHEMICAL COMPANY

"Our business is so diverse," continues Mr. Thomas, "that it would be impossible to keep abreast of shifting market needs without the help of business publications. Our top executives – and our down-the-line people, too – consider business publication reading a necessary routine."

You will find that top men like Mr. Thomas, in *every* industry use business publications as a prime source of information about their own industry and their markets. And they not only read the editorial content, but they also place equal weight on your advertising message – for there, too, they find valuable information that can help them in their business.

That's why business publication audiences are *interested* in your advertising message. And that's why these publications are direct sales routes for your product or service.

Write for list of NBP publications – see how you can pin-point your market through the use of these technical, scientific, industrial, merchandising and marketing magazines.

NBP

NATIONAL BUSINESS PUBLICATIONS, INC.

1413 K Street, N. W., Washington 5, D. C. • STerling 3-7535

Insure Uniform Quality Cooking

DOUBLE-CHECK with COOK-CHEX

The Easy-To-Use Cooking Indicator Tag

When a Cook-Chex is attached to a retort basket . . . *Anyone* in your plant can double check, at a glance, *two important* facts!

1. **The basket has, or has not, been through the cooking process.**
2. **It has, or has not, been subjected to proper cooking conditions.**

These two facts are important to you because they eliminate the usual problems of: a wrong cook schedule, keeping baskets in sequence, and the possibility of "losing" uncooked baskets!

Easy-to-use Cook-Chex signal these essential facts automatically! Cook-Chex, produced with a *purple* chemical ink, turn color to *green* only after your proper cooking conditions have been achieved. Cook-Chex react to precise conditions of temperature, steam and time; and, may be ordered to meet your specific cooking requirements.

Cook-Chex are also excellent as a low cost, permanent record for your cooking-room operations.

Double-check with Cook-Chex to insure uniform quality in your food products. Send for supply of Cook-Chex samples.

ATI COOK-CHEX

Another product by ASEPTIC-THERMO INDICATOR COMPANY

Aseptic-Thermo Indicator Company
11471 Vanowen St., North Hollywood, Calif. FP-7

Please send a FREE supply of Cook-Chex for use with a cooking process of _____ degrees F., for _____ minutes.

Name_____

Position_____

Company_____

Address_____

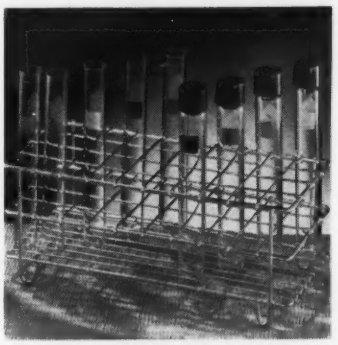
City_____ Zone____ State_____

When inquiring check 4930 opposite last page

Color-coded cultures—seven-hued tubes speed work

Uses: Where large numbers of samples or cultures are being handled.

Features: Each tube bears a one-half inch square of permanent color. Code colors include red, yellow, green, black, blue, white, clear glass.



Three sizes of tubes are available

Description: Color marking greatly reduces need for labeling. Identification can be made quickly—even at a distance. Tubes also have a sandblasted marking spot for additional information. Two types are available: screw-capped and plain end.

(Color-coded culture tubes are a product of Owens-Illinois Glass Co., Dept. FP, Toledo, Ohio. Check 4931 on form opposite last page.)

Bulletin covers latest in poly lab ware

A one-piece, sterilizable graduated cylinder; beakers with softening points above 250°F; un-spillable pipet-fillers are among new items in bulletin on polyethylene laboratory ware. Other items include 13-gal aspirator bottles, translucent tubing, funnels, stoppers, test tubes.

"Fisher Polyethylene Ware" bulletin is available from Fisher Scientific Co., Dept. FP, 346 Fisher Bldg., Pittsburgh 19, Pa. When inquiring specify 4932 on form opposite last page.

When inquiring check 4933 opposite last page

V 18 N 7 JUL 57 UMI

... for food process quality control

Introducing the

Brookfield VISCOMETRAN

Easily installed under any conditions in tanks, vats, or production systems, the new Viscometran continuously measures vital viscosity. Combined with any standard recorder, the unit can either automatically signal the danger or activate controlling devices to prevent variations.

An unusually flexible sanitary instrument, the Viscometran will measure either Newtonian or non-Newtonian type materials from emulsions, suspensions, and slurries to fiber bearing products.

Now viscosity control can mean quality control! It will pay you to find out more about the economical, easily maintained Brookfield Viscometran. Complete information is yours without obligation by return mail. Write, wire, or phone — or tear out and mail this whole ad, using the coupon below.

Brookfield
ENGINEERING LABORATORIES, INC.
STOUGHTON 37, MASSACHUSETTS

Send more information to.....

.....

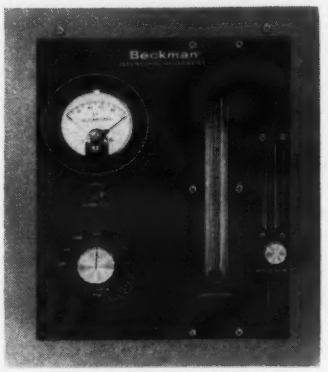
When inquiring check 4934 opposite last page

quality control

Quick lab analysis of gases, liquids

Lightweight instrument has regulated flow control

Uses: For quick and accurate analysis of gases and liquids with boiling points up to 350°C. Applicable for research relating to refrigerants, agricultural chemicals, and fumigants.



Chromatograph precisely identifies components

Features: Light-weight and compact. Conduction heating and proportional temperature control give quantitative accuracy and precise identification of components.

Description: Instrument adapts primary principle of gas chromatography, utilizing a tubular column packed with a material that separates components by passing them through the column at different rates.

Regulated flow control increases over-all stability and eliminates pressure surges which give false readings. Highest reproducibility of sample volume is insured with a liquid sampler and a precision gas sampling valve. Instrument is line operated — 115 v AC. It can be connected to a 1-millivolt high-sensitivity potentiometric recorder for reproducing values of 0.1% full scale.

(GC-2 high temperature Gas Chromatograph is available from Scientific Instruments Div. of Beckman Instruments, Inc., Dept. FP, 2500 Fullerton Rd., Fullerton, Calif. . . . or check 4935 opp. last page.)

Do You Have A Deburring Headache?

GET THE FACTS ABOUT

CRATEX
RUBBERIZED ABRASIVES

"The World's Best For Industrial Use"

Exceptionally superior and unparalleled for:

DEBURRING, SMOOTHING, CLEANING and POLISHING operations after dimensional shaping

For removing rust, heat-marks, tarnish, fatigue lines, scratches, excess solder, corrosion and other surface defects: for blending-in polishing welded seams, final sharpening and polishing to lustre-like finish.

CRATEX IS MADE IN FOUR DIFFERENT GRITS
Coarse Grit to Extra Fine in
WHEELS · POINTS · BLOCKS STICKS · CONES
For Machine or Manual Application on the broadest range of
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Backed by over 30 years industrial, professional and technical application, CRATEX Rubberized Abrasives are widely used nationally and in foreign countries. Made from "premium quality chemical rubber bonds" pressure-molded into uniform textures without hard or soft spots—resilient to absorb shock—ready for instant use—offer uniform controlled "cushioned action" with ease of manipulation for dimensional accuracy, without loss of tolerances.

OPERATE SAFELY, EFFECTIVELY AT SPEEDS UP TO 5,500 S.F.P.M.

Send for comprehensive illustrated catalog—learn how CRATEX Rubberized Abrasives can cut your costs, speed production and insure quality results. Sold at leading industrial supply dealers.

CRATEX MANUFACTURING CO.
81 Natoma St., San Francisco 5, Calif.

When inquiring check 4936 opposite last page

Table top infrared spectrophotometer

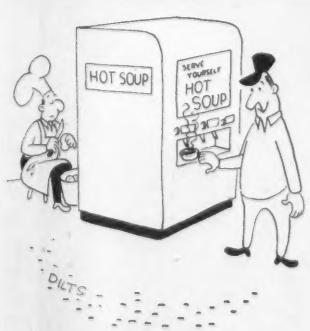
Versatile instrument is in low price range

Uses: Especially suitable for use in laboratories with limited budgets where work in infrared has heretofore been limited due to prohibitive cost of existing double-beam infrared equipment.

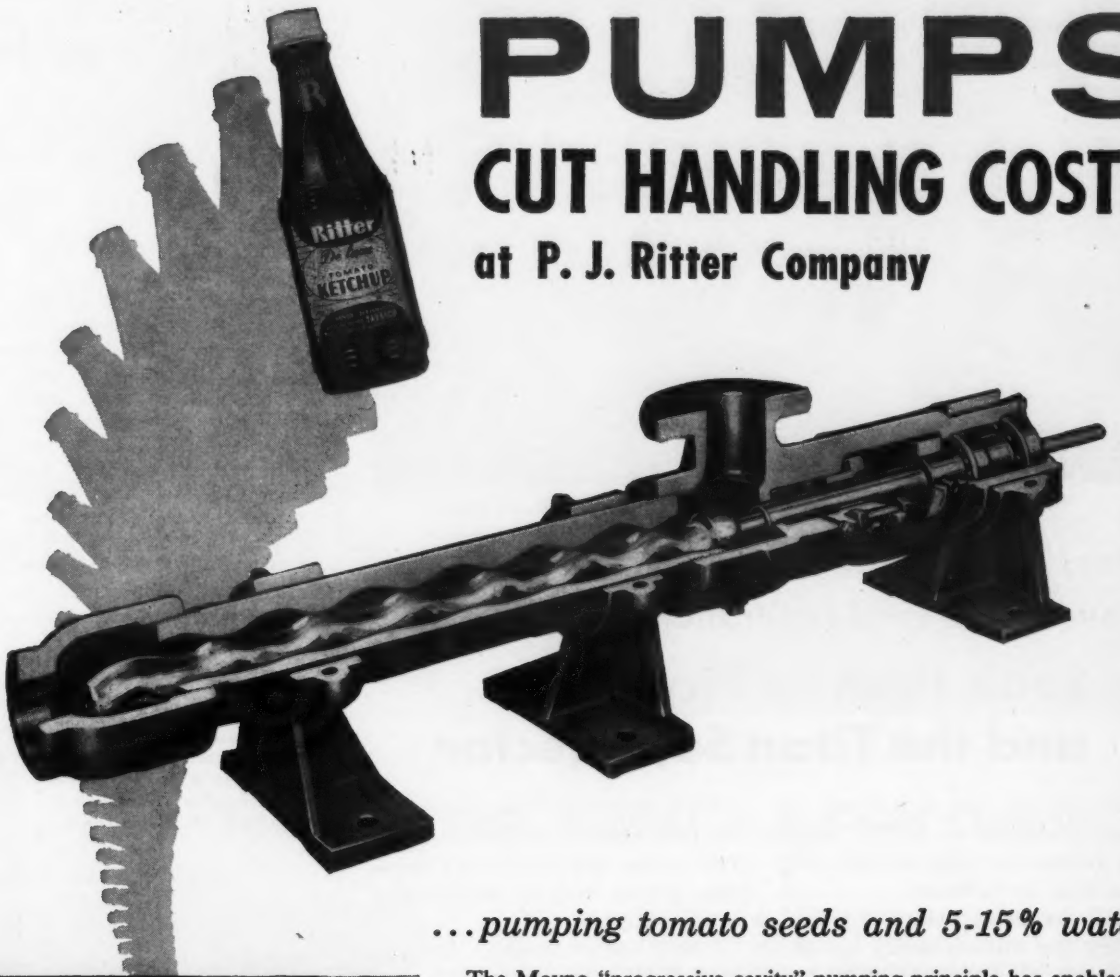
Spectrophotometer has 80 sq cm base prism

Features: Compact design, measurements being 47 x 30". Provisions have been made to allow for differential analysis merely by addition of a fixed slit mechanism, a variable scan drive, and an AC bias. The 80 sq cm base prism assures optimum performance in minimum time, an important consideration in routine quantitative analysis.

(Model KM-1 tabletop infrared spectrophotometer is a development of Baird-Atomic, Inc., Dept. FP, 33 University Rd., Cambridge 38, Mass. . . . or for more information check 4937 on the convenient Reader Service slip opp. last page.)



MOYNO® PUMPS
CUT HANDLING COSTS
at P. J. Ritter Company



. . . pumping tomato seeds and 5-15% water

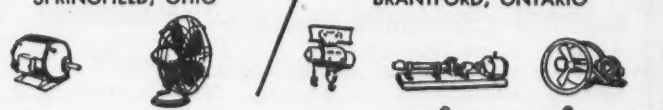
The Moyno "progressive cavity" pumping principle has enabled thousands of plants to pipe difficult materials that were transported by hand and other expensive means. For example, The P. J. Ritter Co., famous food packers since 1854, have increased efficiency by installing seventeen Moyno Pumps. The one shown at the left is pumping tomato seeds in 5-15% solution at 10 gallons per minute. The pump runs at 600 RPM.

Moyno is the only pump that will handle many difficult materials such as abrasives, pastes, slurries, chemicals, foods, suspended solids, etc., without foaming, aerating, crushing or excessive pump wear.

Examine your processing methods. No doubt there are several places where Moyno Pumps can drastically cut costs. Ask us, we'll give you a prompt answer. Send us an outline of your problem today! Write for Bulletin 30-FP.

ROBBINS & MYERS, INC.

SPRINGFIELD, OHIO — BRANTFORD, ONTARIO



Motors · Fans · Hoists · Moyno® Pumps · Propellair® (Industrial) Fans

When inquiring check 4938 opposite last page

IN ONE PASS these Titan Superjectors separate animal fats, wash water, and solids.

Does sludge slow down your liquid-solid separations?

Look then to Pfaudler and the Titan Superjector

This unique new centrifuge can handle slurries up to 35% solids by volume for a full month without need for cleanout.

All sludge is discharged periodically and automatically through a series of hydrostatically controlled slots.

The Titan Superjector concentrates solids up to 40% by volume, clarifies liquids down to 0.00% solids, and can discharge mixed solids particles up to ⅛" diameter with specific gravities up to 1.60.

Such performance makes it ideal for separating fats and oils, fruit juices, hot wort, dairy products, grains, and for wash water treatment.

Power consumption, by the way, is 50% less than with conventional units since there is no braking effect from the continuous discharge of solids.

Check the coupon for more information on the Titan Superjector and other integrated process equipment from Pfaudler.

THE PFAUDLER CO., Dept. FP-77, Rochester 3, N.Y.

Please send bulletins on the ☐ Titan Superjector and this other Pfaudler Food Processing Equipment: ☐ Heat Exchangers ☐ Tanks—Mixing and Storage ☐ Conical Dryer-Blenders ☐ Fillers—Rotary Piston Type ☐ Evaporators—Film Type

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

When inquiring check 4939 opposite last page

fp PROCESSING EQUIPMENT

Puts more fruit in can . . . less in the waste

Dole gets more yield per ton of pears with new 'close shave' machine

No one wants to throw money away . . . least of all the Dole Hawaiian Pineapple Co., the aggressive Honolulu company which began "invading" the mainland in 1948, and acquired two more mainland canneries in 1955. At its California Production Division plant in San Jose, Calif., Dole found it could get more finished product out of a ton of fresh pears. The change that made the difference was a recently-developed pear peeling and coring machine.

In effect, the new machine puts more pear in the can, less in the waste chutes.

Dole tried out an initial installation of 24 of the machines at the San Jose plant the season before last. Based on performance of these, the company will operate 92 machines during the 1957 season.

One woman can feed 72 pears per minute into the machine, which shaves off the skin in a

Burton Coons, co-inventor with his son, shows paper-thin peel which is shaved from pear. Yield increases of 6 to 8 cases per ton are possible with these machines, Mr. Coons states

Close-up shows two of six spindles on one machine. Operator can feed 72 pears/min.

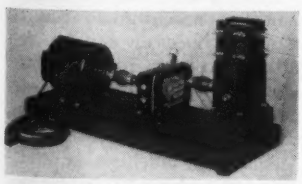
waste chutes

thin strip, removes the seed cells and stem, then discharges the peeled and cored pear in form of whole or halves. Safety of operation is featured. After woman has placed six pears in respective cups, the cups retract away from table, into recess of machine. Machines are placed in batteries, back to back. Servicing is done from aisle between the rows, where all operating parts are accessible.

(Coons pear machines, invented by Burton C. Coons and Willard Coons, are manufactured and distributed on lease basis by Atlas-Pacific Engineering Co., Inc., Dept. FP, 67th and Hollis, Emeryville 8, Calif. . . . or for more information check 4940 on form opposite last page.)

No-contact pump available in very small capacities

Well-known no-contact pump, which operates by moving steel fingers in wave-like motion over flexible tubing, is now made in small model, with capacity ranging

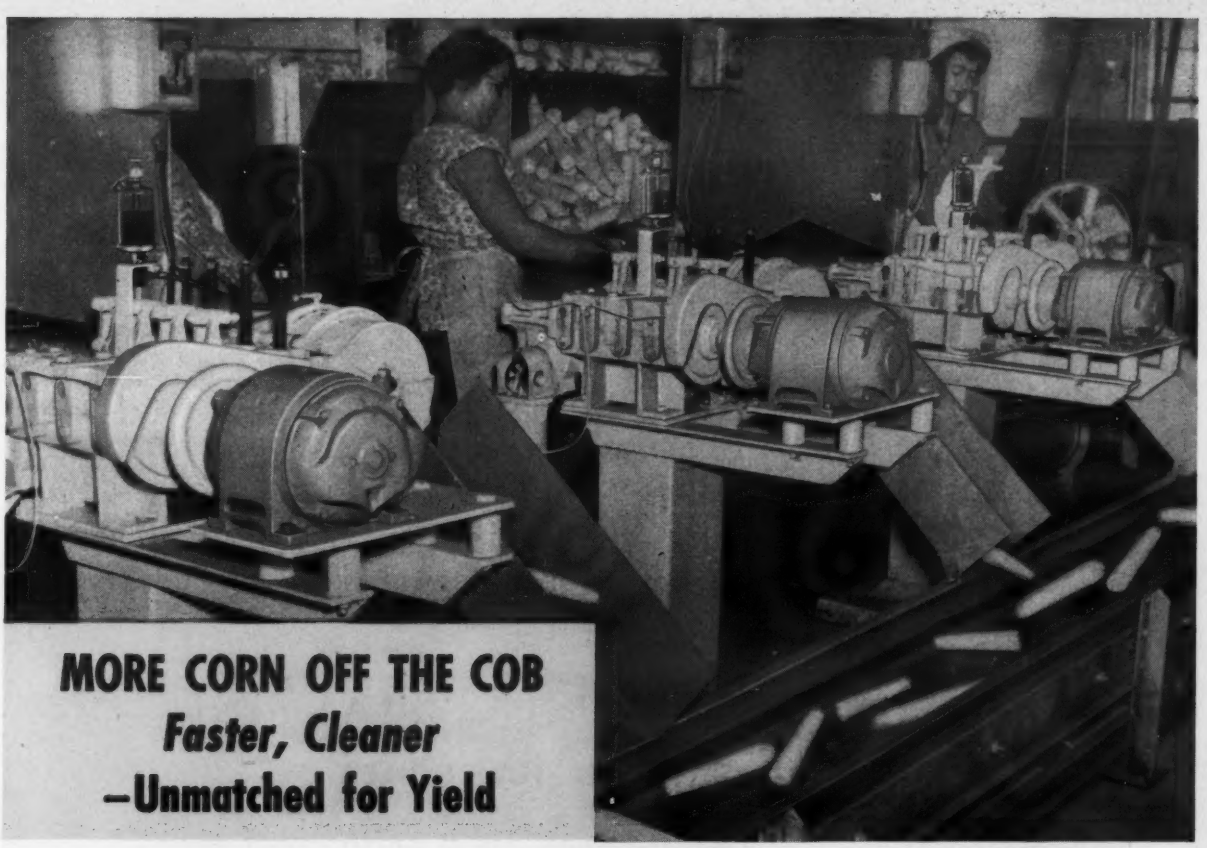


Pump handles tubing sizes from 1/32 to 1/4" ID

from 0.1 to 250 cc/min. Chief advantage is that pumped fluid never touches any pump part, eliminating contamination or corrosion problems.

Tubing can be gum rubber, silicone rubber, Neoprene, polyvinyl chloride.

(Model T-8 pump is product of Sigmamotor, Inc., Dept. FP, 13 N. Main St., Middleport, N.Y. . . . or check 4941 on form opposite last page.)

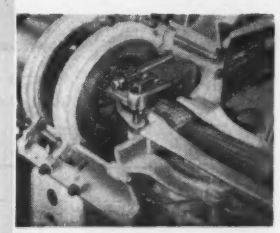


MORE CORN OFF THE COB
Faster, Cleaner
—Unmatched for Yield

Morgan Packing Company, Inc., with 48 FMC Model 3-A Cutters in three plants, shows impressive production gains on cream style corn.

The New FMC Model 3-A Corn Cutter

- ✓ Up to 7% more yield per ear!
- ✓ Up to 20% more output per cutter!
- ✓ No grading—handles mixed ear sizes!
- ✓ Less maintenance—21% fewer parts!
- ✓ Up to 50% more cutting between honings!



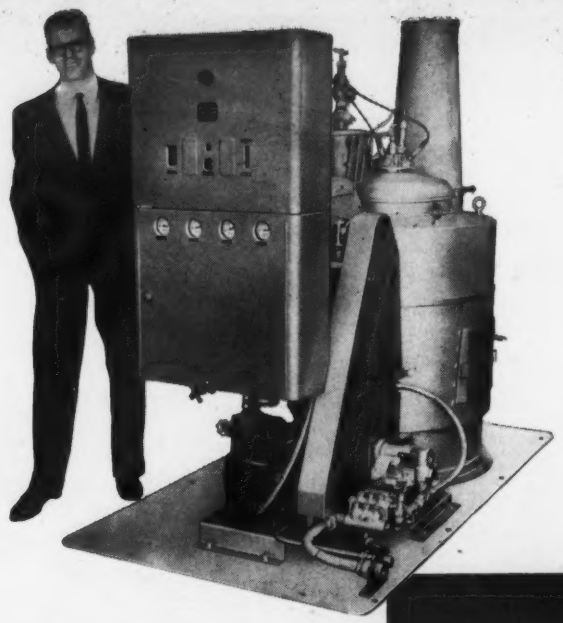
Automatic pre-opening of knives assures proper cut, deep or shallow, according to ear size. Gauging fingers and knife settings are adjusted instantly while cutter is in operation.

Many leading plants put thousands of production hours on hundreds of new Model 3-A Corn Cutters last season. Conservative customer estimates of increase in yield range up to 7%—depending on make and model of corn cutters replaced. In case after case, yield and quality are reported as greatly improved—even where operations average 120 or more ears per minute! Featuring A.S.D. —"Automatic Size Detection," the all-new Model 3-A utilizes a system of pre-opening knives which cut mixed ear sizes to any desired depth—without size grading or constant machine adjustment. Get the full story from your FMC representative, or write for descriptive bulletin No. 601-E today. You'll want information on the FMC easy-to-use Knife Honer, too.

fmc
FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division
General Sales Offices:
WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

When inquiring check 4942 opposite last page

V187 JUL 57 UMI



don't use floor space for your boiler room

VAPOR MODULATIC

WATER TUBE BOILER

you can put it on the roof—
on a balcony—or hang it
from the ceiling

PAY FOR YOUR STEAM
THRU FLOOR SPACE SAVED

OVER 15,000
SATISFIED USERS

produces up to 4 h.p. per sq. ft. of area

- Develops up to 27 H.P. per 1000# of weight.
- Produces up to .6 H.P. per *cubic ft.* of space used.
- Needs only 15" above top of boiler for maintenance. No additional floor space needed.
- Can produce 10% or more above ratings, continuously.
- Full ASME approved.
- It is a complete package unit.
- Proved by 25 years in America's toughest boiler rooms.

8 sizes: 10 to 160 H.P.
Pressures: 5 to 900 psig.

Write for complete specifications on the boiler that requires less space and permits lighter floor structure—The Vapor Modulatic.

VAPOR HEATING CORPORATION, 80 E. Jackson Blvd., Chicago 4
Dept. 7-G

Send me Modulatic Bulletin No. 586.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

When inquiring check 4943 opposite last page

64-page catalog covers sanitary pump line

Comprehensive, 64-page catalog covers complete company line of sanitary and corrosion-resistant pumps. Well-known pumps have wide acceptance in dairy, canning, beverage fields. Instructions on estimating pump capacity, flow, drives, speeds, as well as operating and servicing instructions are all included.

Pump catalog is issued by Waukesha Foundry Co., Dept. FP, Waukesha, Wis. Specify 4944 opposite last page.)

Machines make pies at high speed with little dough scrap

Large unit runs all sizes or one size; small machine makes turn-over pies

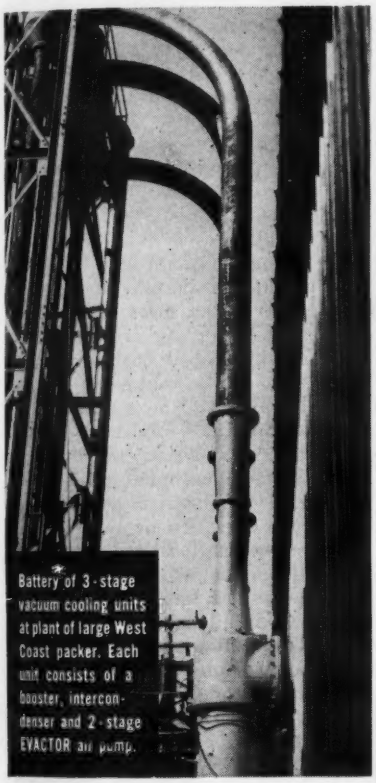
Features: Produces pies with 25-50% less trim or scrap. Fillers do not string fruit from one pie to another. Crimper and cut-off mechanism made in separate units. Pies do not come out egg-shaped. Continuous dough sheeters compress dough in one direction. This causes it to puff up when baked, thus making it more flaky instead of shrinking and drawing up, which occurs when it is stretched in two directions.

Description: Built as a combination machine to run all sizes of pies, or can be furnished to run just one size. Delivers up to 100 large pies per minute or 250 small pies, using four workers.

A small machine is available for making turn-over pies for frying, baking, or freezing. Shoes or molds are made of cast aluminum and fastened close together so that there is no trim or scrap dough between pies. Unit runs up to 100 pies per minute with four workers. It has a small pan depositor, docker, and crimper unit for 4" pastry shells.

(Pie machines are made by K & M Machine Co., Inc., Dept. FP, 2271 Young Ave., Memphis, Tenn. . . . or check 4945 on form opp. last page.)

THREE-STAGE VACUUM CHILLING PROTECTS VEGETABLES



Battery of 3-stage vacuum cooling units at plant of large West Coast packer. Each unit consists of a booster, intercondenser and 2-stage EVACTOR air pump.

WITH this Croll-Reynolds CHILL-VACTOR installation, lettuce and other vegetables can be cooled almost instantaneously to any temperature desired, without danger of freezing. This rapid chilling action removes the heat stored up in leafy vegetables, greatly prolongs their shelf-life and improves their appearance.

The Croll-Reynolds Company have been pioneers in the field of vacuum precooling of vegetables — having cooperated with the original produce shippers who used this process. Other food applications include deodorization of edible oils, meat cooling, evaporation of milk, juice concentration and de-aeration, distillation and manufacture of essential oils, etc.

For all your cooling and process vacuum requirements, call on Croll-Reynolds ...specialists in applying vacuum to food processing and cooling.

CROLL-REYNOLDS

Croll-Reynolds CO., INC.

Main Office: 751 Central Avenue, Westfield, N. J.
New York Office: 17 John Street, N. Y. 38, N. Y.

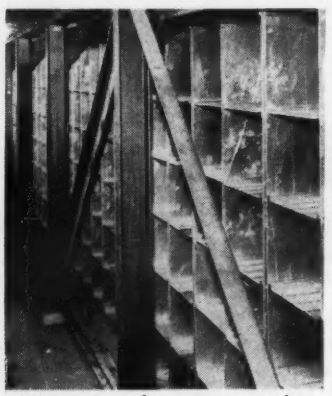
CHILL-VACTOR UNITS
EVACTOR STEAM JETS • CONDENSING EQUIPMENT

When inquiring check 4946 opposite last page

Ice cream hardener loads and unloads automatically

Package carriers are pushed through tunnel by hydraulic ram unit

Uses: Designed for quick freezing one gallon cartons of ice cream or packaged food products.



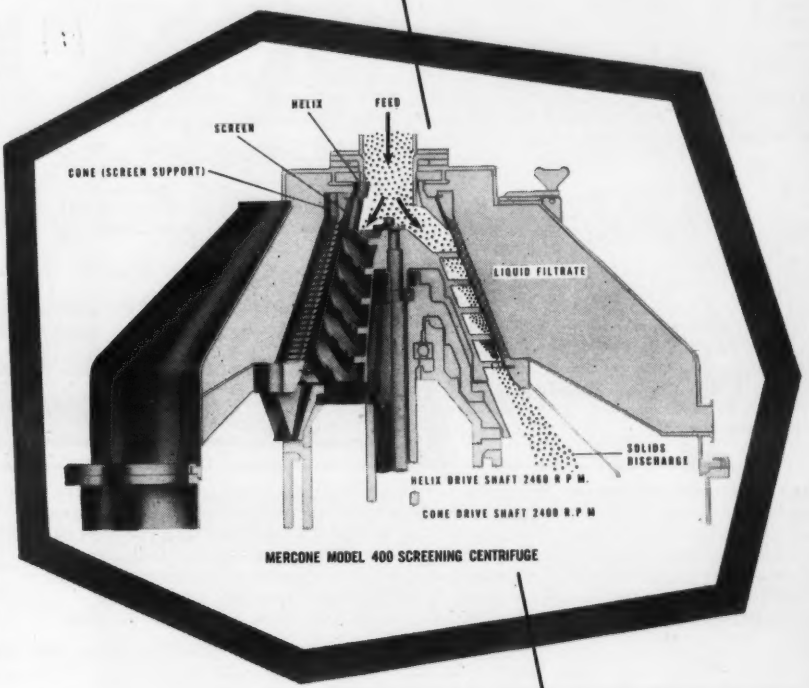
Movement of carriers can be geared to production rate

Features: Loading and unloading is automatic. Incorporating conveyor eliminates use of loading ram and avoids crushing of unfrozen packages entering freezer. Package carriers are pushed through cold tunnel by hydraulic ram. No chains, sprockets, or idlers are used within the low temperature stream, eliminating a potential maintenance problem.

Description: Principal components include channel compartments or shelves, for holding cartons; carriers made up of several compartments arranged in single vertical rows; two tiers of carrier stacks; a cold tunnel which houses the tiers; and hydraulic mechanisms for raising, lowering, and advancing carriers. Carriers, with multiple compartments, give the equivalent of multiple belt tunnels without need of return belts and high floor space requirements.

(FES hardeners are available from Freezing Equipment Sales, Inc., Dept. FP, 415-A West Market St., York, Pa. Check 4947 opp. last page.)

Positive advantages in fine starch fiber dewatering... productive



MERCONE MODEL 400 SCREENING CENTRIFUGE

The Mercone* Screening Centrifuge

Combining the outstanding features of a centrifuge and a screen, the Mercone Screening Centrifuge provides *continuously* high rate dewatering of fibers — and at a lower cost than any other known means.

Highly successful applications of the unit to the dewatering of fine starch fiber have conclusively proven these advantages:

Fine fiber processing costs reduced . . . Low moisture solids discharged from the Mercone can either be dried directly or further dewatered mechanically, high labor cost methods previously used are eliminated.

"Prime Product" recovery increased . . . Filtrate from Mercone contains starch not recovered in previous washing steps and ordinarily lost to feed product.

Increased protein content of fiber . . . Greater proportion of fine fiber can be added to high protein gluten resulting in increased premium grade gluten meal production.

Typical operating results on the performance of the Mercone Screening Centrifuge as applied to fine starch fiber washing are available. For complete information on this new tool for food processing, just drop a line briefly describing the particular application you have in mind. Dorr-Oliver Incorporated, Stamford, Connecticut.

*Mercone is a trade mark of Dorr-Oliver Incorporated.

DORR-OLIVER INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U.S.A.

When inquiring check 4948 opposite last page

"We use a Heil Dryer to dewater a mixture of partially dried corn fibers and concentrated proteinaceous corn steepwater. The mixture enters the drier at 35% H_2O, and leaves at 11%. After grinding and classifying, this constitutes our commercial corn gluten feed.

"The mixture fed to the drier is of a sticky nature which tends to form partially dried dark pills in long retention-type driers. The Heil dryer, being a short retention-type drier is the only one of this class tested which produces a final product showing little or no tendency to "pack" during a subsequent storage or shipment.

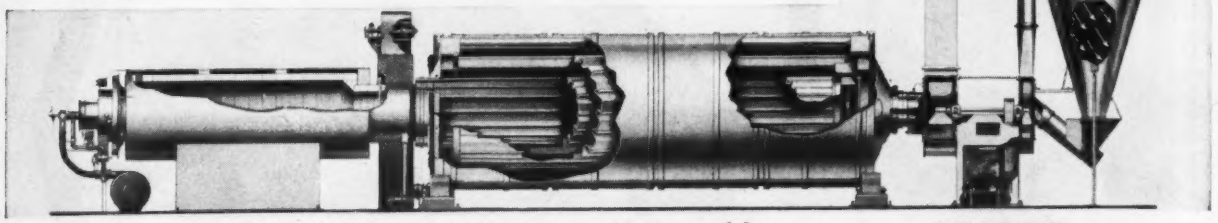
"The Heil Dryer has enabled us to handle large volumes of feed with a minimum of floor space, low maintenance, good fuel economy and excellent temperature and moisture control. It is also capable of being operated, unhoused, under all types of weather conditions.

"We are starting a program this year to rehabilitate our entire corn residue drying plant and expect to install five or six of these Heil units for corn gluten feed and corn gluten meal dehydration service."

Assistant Plant Manager
Engineering and Mechanical
AMERICAN MAIZE-PRODUCTS COMPANY
Roby, Indiana

Heil dries corn products

Cutaway view showing cylinders and the compound showering flights.



Dryer controls moisture. Food by-products are carried on a stream of hot air in the Heil dryer. Having 3 cylinders in one drum automatically gives each particle correct exposure time based upon its weight due to moisture content. Compound showering flights assure ideal use of drying medium, air activity in all areas of the drum and maximum evaporation within a compact machine. Accurate temperature controls assure exceptional quality and color.

Write, wire or call for details.

THE HEIL CO.
Manufacturers of Ardrier Dehydrators for the Arnold Dryer Company
Dept. 807, 3000 West Montana Street
Milwaukee 1, Wisconsin

When inquiring check 4949 opposite last page

Liquid-Tight PIONEER Gloves For Every Food Processing Job

A. Whitecap White All Neoprene . . . . 3 sizes, 10½" length, light wgt.
B. Stanflex Blue Plastic Coated Jersey . . . Full and Palm-Coat, 3 styles
C. Stanflex Knit-Lined Red Plastic . . 4 sizes, 11" length, medium wgt.
D. Sheergrip Natural Latex Rubber . . . 9 sizes, 3 lengths, sheer wgt.

Mail This Coupon Today

The PIONEER Rubber Co.
222 Tiffin Road
Willard, Ohio, U.S.A.

N-30
5232
VL-34
0754

Pioneers in Hand Protection — For Over 35 Years

Please send me:
☐ The name of my nearest PIONEER Glove Distributor.
☐ 1956-57 PIONEER Industrial Glove Catalog.
☐ Hand Protection Clinic glove recommendation for job described in enclosed letter.

Firm _____
Address _____
City _____ Zone ___ State _____
Signed _____

When inquiring check 4950 opposite last page

to help make **YOUR** *brand the one they like best*

check up on
SPRAY NOZZLES

To improve product quality and lower spraying costs, Spraying Systems offers the advantages of advanced design and better performance. Typical applications include mixing, washing, cooling and spray drying. We also offer spray nozzles to meet unusual conditions such as high abrasion or extremely fine atomization.

WRITE FOR CATALOG 24 forty-eight pages of complete data on thousands of types and capacities.

SPRAYING SYSTEMS CO.
3213 Randolph St. • Bellwood, Ill.

ADVANCED SPRAY NOZZLE DESIGN FOR NEW DIMENSIONS IN CONTROL AND PERFORMANCE

When inquiring check 4951 opposite last page

Metal-to-metal contact coupling's unique

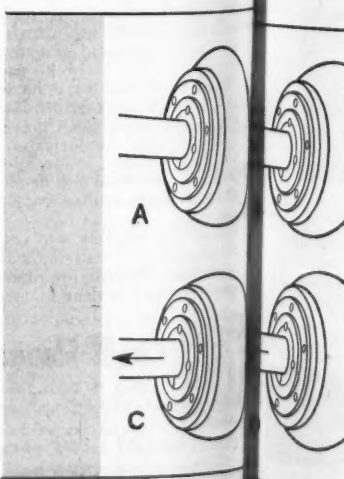
Misalignment controlled by tire and hub assembly

A revolutionary new coupling consists of a flexible tire clamped between two hubs which are mounted on shafts to be coupled. Body of the coupling has four-way flexing action, with the flexible member cushioning load shocks and diminishing torsional vibration.

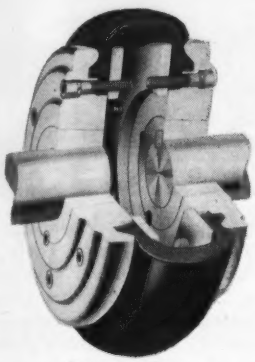
Flexible member is held between the flanges and clamp rings of the hubs. Both hubs of the coupling are machined to take special bushings. They give the equivalent of a shrunk-on fit on the shaft and permit quick and easy application to shafts of different diameter without reboring. A transverse split is molded into the tire. To change caps, screws are loosened enough to allow removal and replacement with another tire.

Coupling takes angular misalignment up to four degrees, parallel mis-alignment up to 1/8", and end float up to 5/16" — contingent upon size and shape of coupling and

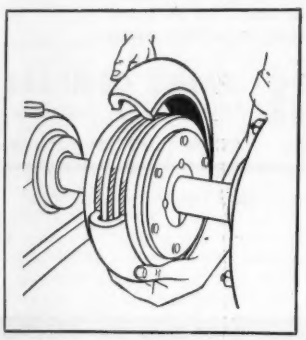
Views show how coupling functions in (a) angular misalignment, (b) parallel misalignment, (c) end float, and (d) in absorbing vibration



eliminated by flexing member



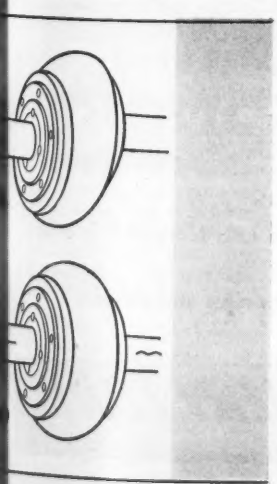
Cutaway view



Transverse split simplifies removal of tire

duration of conditions. It will also take all three of these simultaneously.

(Para-flex couplings are a development of Dodge Mfg. Co., Dept. FP, Mishawaka, Ind. Check 4952 opp. last page.)

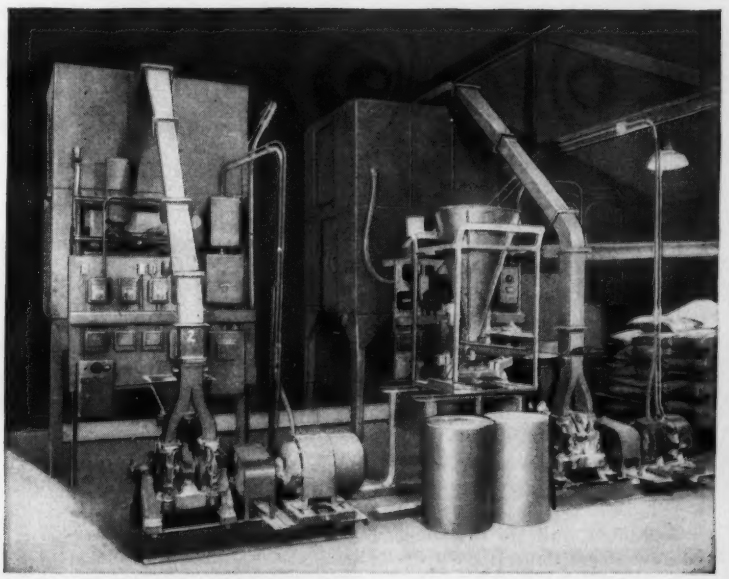


Mikro-D Twin Unit Installation

GRINDS COCOA POWDER "TO ORDER"

A. Cramer Corporation is a custom grinder, serving some of the nation's leading manufacturers of foodstuffs. To meet the problem of grinding cocoa powder to exact specifications, this busy organization relies on the quality and round-the-clock dependability of MIKRO-D pulverizing and collection equipment. As an example of just how effectively MIKRO-D equipment is performing for Cramer Corporation, a *single unit* of the two units shown here, has produced cocoa powder at 600 to 650 lbs. per hour . . . at 98-99% through 325 mesh!

MIKRO-D equipment can help you put new efficiency and economy into whatever products you grind. We'll be glad to make test runs on the unground material, and submit recommendations entirely without obligation. Whether your operation calls for a standard unit or a specially-engineered system, MIKRO-D equipment can fill all your grinding and collecting requirements.



Installation at A. Cramer Corp., Oak Lawn, Ill., consists of two #6 MIKRO-D MIKRO-ATOMIZERS, each connected with and discharging to #36-1-84 MIKRO-D MIKRO-COLLECTORS. Unit at right is used to grind sugar as well as other products.

GENUINE MIKRO-D REPLACEMENT PARTS
Available From Large Stock Within 48 Hours.

Mikro-D

PULVERIZING MACHINERY DIVISION
METALS DISINTEGRATING COMPANY, INC.
10 Chatham Rd. Summit, New Jersey

MANUFACTURERS OF PULVERIZING, AIR CONVEYING AND DUST COLLECTION EQUIPMENT

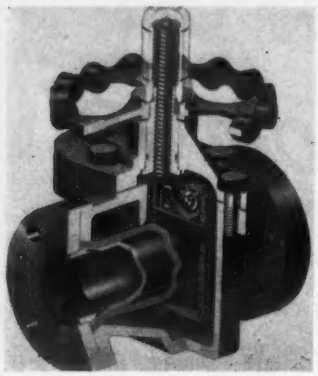
When inquiring check 4953 opposite last page

V 18 7 JUL 57 UMI

NEW LITERATURE

Catalog on pinch-type valves lists food uses

Fifty-page catalog details full line of flexible, pinch-type, hose-bodied valves in both standard and new metal-



Cutaway shows how metal-enclosed pinch-type valve closes on hose

enclosed designs. Includes list of what foods can be handled in such valves. Data section has information on how recommended material hose should be constructed.

Cat FL-1116, "Flex Valve", is available from Farris Flexible Valve Corp., Dept. FP, 400 Commercial Ave., Palisades Park, N.J. When inquiring specify 4954 on form opposite last page.)

High-efficiency valve in homogenizer

Technical bulletin describes homogenizers and high-pressure pumps for the dairy industry, with emphasis on recently-developed two-stage valve used on the homogenizers. Valve is reportedly 25% more efficient than previous types.

Ten-page bulletin is profusely illustrated with cutaway diagrams of various portions of equipment. Specifications and data are also included.

Bulletin DJ-57 is issued by Manton-Gaulin Mfg. Co., Dept. FP, 44 Garden St., Everett 49, Mass. When inquiring specify 4955 on form opposite last page.

"KERODEX" protected hands wash clean without scrubbing.

"KERODEX" spreads on like a cream but acts like an invisible glove to shield the skin from the vast majority of industrial irritants such as acids, alkalis, solvents, paints, cutting oils, and resins. "KERODEX" does not smear. It does not affect materials handled, nor is it affected by them. Two types of "KERODEX" are available for "wet" and "dry" work. Write for full information on "KERODEX"® barrier creams to Ayerst Laboratories, 22 East 40th Street, New York 16, N. Y. 5759

When inquiring check 4956 opposite last page

water tank INTERIORS get better PROTECTION with ZINCOATER!

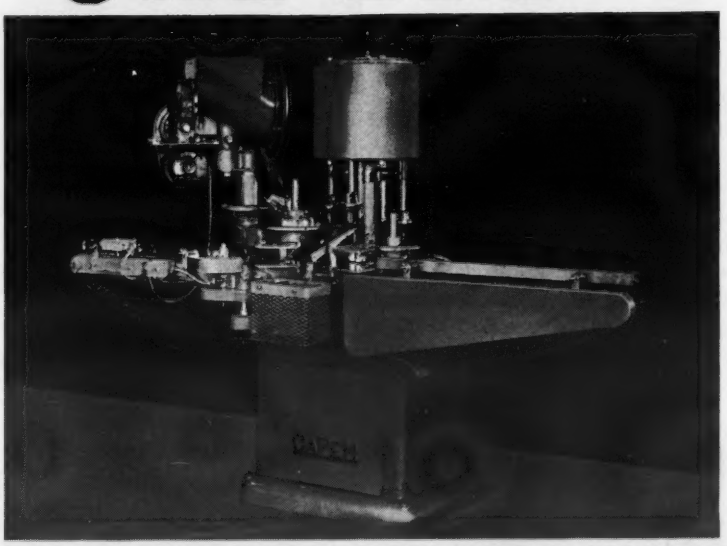
500-hour corrosion tests prove Zincoater superior to galvanizing for metal protection. Three coats of Zincoater on steel water tank interior surfaces provide a non-contaminating zinc coating that clings tightly, smoothly. Eliminates broken blisters and bare metal patches experienced with ordinary paints. Also ideal for exterior metal surfaces constantly or intermittently immersed in water.

FREE! Complete information on Zincoater's outstanding performance on all kinds of steel and galvanized iron surfaces. Address:

TROPICAL PAINT COMPANY
1130-1252 W. 70th, Cleveland 2, Ohio
HEAVY-DUTY MAINTENANCE PAINTS SINCE 1883 • SUBSIDIARY OF PARKER RUST PROOF COMPANY

When inquiring check 4958 opposite last page

CAPEM THE MODERN SCREW CAPPER



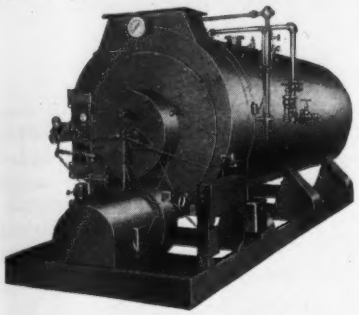
- Applies any type of standard screw cap or cover at speeds of 2,000 to 10,000 per hour.
- Takes container from conveyor line, applies cap perfectly, and returns container to conveyor AUTOMATICALLY without intermediate handling.
- Handles bottles, jars, cans or jugs of any size or shape.
- Delivers a perfect, LEAKPROOF seal at low cost.
- Available in 1, 2, 4, 6 and 8 spindle models.

Write for prices and delivery

CONSOLIDATED PACKAGING MACHINERY CORP.
Buffalo 13, New York

When inquiring check 4957 opposite last page

want to buy a pound of steam for less money?



CYCLOTHERM...

engineered for economy, cuts steam costs.

Cyclotherm's automatic operation and simplified construction keep costs down to an absolute minimum. Automatic controls allow 60 hp (or larger) models to modulate from 30% to 100% of capacity without loss of efficiency. Smaller models automatically cycle on and off as steam is needed.

Cyclotherm's two-pass construction guarantees a minimum of 80% efficiency, cuts maintenance costs 30% to 50%. Firetube never needs cleaning. Front and rear assemblies are quickly removed.

Shipped ready to operate, Cyclotherm is a complete package boiler with one manufacturing responsibility. Sizes range from 18 to 750 hp (15 to 200 psi). Designed to burn oil, gas or combination. For full information, write Cyclotherm Division, National-U.S. Radiator Corporation.

YEARS AHEAD IN STEAM GENERATION CYCLOTHERM

Cyclotherm Corporation
National-U.S. Radiator Corp.
34 E. First St., Oswego, N. Y.

Send me free copy of your booklet, "Cyclotherm Cyclonic Combustion."

Name.....
Company.....
Address.....
City..... State.....

When inquiring check 4959 opposite last page

Tells how the "new angle" affects food packaging

Impact of changes in consumer buying habits and the supermarket era has shifted a large part of the selling job to the package. As it replaces the once familiar sales clerk, what is called "peripheral vision" becomes an increasingly important factor. What the shopper sees of a package today, as it is placed on a shelf in the store, is often limited to one edge of the carton and a part of one side. Such "peripheral vision" weakens the impression made by front of the package.

This "new angle" on packaging has been the subject of a study conducted by Dr. Ernest Dichter and sponsored by the Paraffined Carton Research Council. Findings of the study have now been published in a booklet.

"The Man in the Package" is issued by Paraffined Carton Research Council, Dept. FP, 111 W. Washington St., Chicago 2, Ill. When inquiring specify 4960 on form opposite last page.

Reports dairy conference at Michigan State

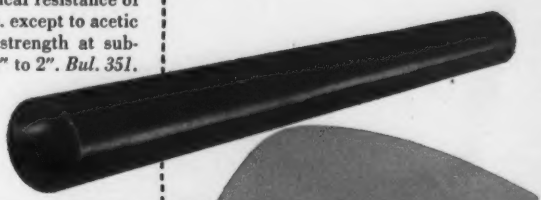
A report of the proceedings of the Fifth Annual Dairy Engineering Conference of last February has been published in a 96-page book. Texts of some 19 papers are presented in entirety. These deal with some of the most important recent developments and their engineering aspects.

Some of the points of interest highlighted are higher temperatures, flavor and odor control, increased automation. Among the papers presented were the following: Weight Control of Milk in Paper Cartons, Plastic Bags for Cream, Refrigerated Truck, and "No-Hold" Pasteurization (Ultra High Temperature — 200 to 300°F).

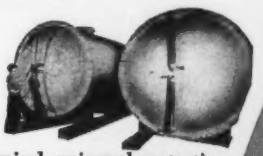
Copies of the Proceedings are available from Continuing Education Program, Michigan State University, East Lansing, Mich., at $2.00 per copy.

STAYS TOUGH AT SUB-ZERO TEMPERATURES

ACE PARIAN . . . odorless, tasteless, rigid polyethylene. Best chemical resistance of any plastic at room temp. except to acetic acid. Excellent impact strength at sub-zero temp. Rigid pipe ½" to 2". *Bul. 351.*



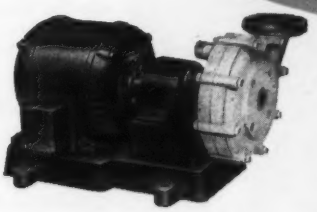
LIFE-TIME ACID STORAGE TANKS
Rubber-lined by ACE 2-layer system



Economical, universal protection against all alkalis, metallic salts, practically all inorganic acids, hydrochloric acid any strength, sulphuric to 50%, nitric to 20%, phosphoric to 75%. Good to 160 deg. F. . . . sometimes higher. Soft rubber interlayer aids shock resistance.

Now eleven ACE Materials to STOP CORROSION

Eleven job-proved rubber and plastic materials now available in ACE piping, valves, pumps and tanks. Tough Ace-lite rubber-plastic blend . . . Saran . . . heat-resistant Tempron . . . Rivicor PVC . . . many others. Write for comparative properties Bulletin CE-50 . . . or call your American Hard Rubber Company distributor.



ACE "WAM" . . . THE FINEST
Non-metallic Acid Pump

On job after job, this 80-gpm. centrifugal pump has earned highest praise. Hard rubber casing and impeller, Hastelloy C shaft. Handles nearly all corrosives. Mechanically simple, trouble-free. *Bulletin CE-55.* Larger ACE pumps available.

NEED SPECIAL FITTINGS, COVERS, TANKS, PARTS?

If you want life-time corrosion protection for special parts needed in quantity . . . we may save for you by molding them of ACE hard rubber or plastics to your most exacting requirements. Our facilities among world's largest. Ask for recommendations.

ACE processing equipment of rubber and plastics

AMERICAN HARD RUBBER COMPANY
93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check 4961 opposite last page

V187 JUL 57 UMI

Ouija boards are passé

Time was, when a person had a question, out would come the ouija board for an answer. This wasn't too accurate a system, of course . . . but a lot of people put a lot of faith in what the ouija board told them.

Times change — and today accuracy is the keyword. That's why the modern business publication wants its circulation audited.

In joining BPA* CHEMICAL PROCESSING has taken an important step toward sound and accurate planning in your behalf. It means that we are checking, double-checking and constantly rechecking —

- **Who you are**
- **Where you work**
- **What your job is**

The Publisher wants and needs this information — and the BPA* audit can assure both him and his advertisers that he is getting his magazine into the hands of people *qualified by their common interests* to receive it. It helps him to give you —

- **Editorials that will *help you in your work***
- **Advertising that will *have value to you***

He can serve you even better if you will complete surveys and questionnaires which he may send you, and if you will give him your thoughts and opinions on the editorials and advertisements in his magazine.

You, the reader, are the *key person* to the publisher — and the BPA* audit helps him in his never-ending effort to think about you and design his magazine for you.

You, the reader, benefit when the circulation of CHEMICAL PROCESSING is audited by . . .

***BUSINESS PUBLICATIONS AUDIT OF CIRCULATION, INC.**
420 Lexington Avenue New York 17, N. Y.

BPA

A Non-Profit, Tripartite Membership Corporation of Advertisers, Advertising Agencies and Business Publications

new literature

New source for sodium caseinate issues analysis bulletin

Announcement as to new source of supply for edible sodium caseinate includes analysis, prices, and amino acid content for this ingredient. The firm also markets lactalbumin, other animal and vegetable proteins.

"CPC Sodium Caseinate, Edible", Tech Bul #1, is issued by Certified Proteins Corp., Dept. FP, P.O. Route 1-Box 236, Mundelein, Ill. When inquiring specify 4962 on form opposite last page.

Pressure packaging data

Third edition of catalog presents current information on one-use pressurized can (aerosol). Includes types of foods which may be so packaged; names of suppliers of valves, filling equipment, and independent filling contractors. One section concerns important federal and state regulations affecting pressure packaging.

"Pressure Packaging", loose-leaf bound, file-folder size, is published by Crown Can Division of Crown Cork & Seal Co., Inc., Dept. HTFP, 9300 Ashton Rd., Philadelphia 36, Pa. When inquiring specify 4963 on form opp. last page.

"Smith, I've told you time and again, 'Hustle, Hustle, Hustle'!"

COOKING CRANBERRIES are mixed by ½ HP LIGHTNIN Portable Mixers to prevent burning, insure uniform cooking.

How to increase the productivity of your **smaller** *mixing operations*

Whenever you work with hu e batches or continuous processes, you study mixing scientifically. It pays.

Many times you can profit as much—perhaps even more—by applying sound mixing procedures to your *smaller* mixing operations.

Easy to use

You can streamline any fluid mixing job with LIGHTNIN Mixers. You can gain higher product quality and greater productivity.

All you do is clamp the right LIGHTNIN Portable Mixers in place and turn them on.

They're easy to keep clean—stainless steel shaft and propellers are the only parts that touch what you're mixing. And they just keep on running—hundreds have been in service 20 years or more.

Mix any fluid in any vessel

You can mix anything—as long as it's fluid—with a LIGHTNIN Mixer—in any kind of open or closed vessel.

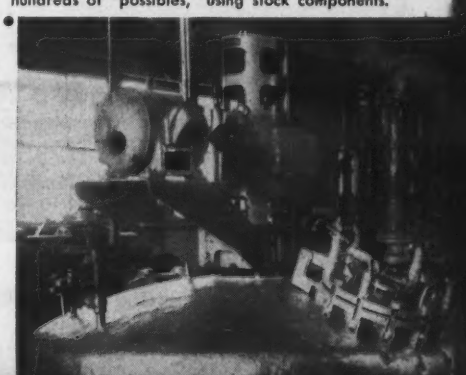
When our engineers recommend a LIGHTNIN for your product, you are guaranteed exactly the mixing action you want—or your money back.

Let us help you streamline your fluid mixing—in *any* size operation, batch or continuous. For a guaranteed recommendation, get in touch with your LIGHTNIN representative (listed in Thomas' Register). Or write us direct.

"Lightnin® Mixers"

MIXCO fluid mixing specialists

THINKING BIG? You can get LIGHTNIN Mixers in any size up to 500 HP. This 25 HP turbine-type LIGHTNIN mixes a 25,000-lb. batch of caramel. Right power-speed combination is selected from hundreds of "possibles," using stock components.



For more information on product at right, specify 4964 see information request blank opposite last page.

WHAT SIZE AND TYPE of mixer do you need? Check here for latest bulletins giving full description, packed with helpful facts on mixing:

- ☐ Turbine, paddle, propeller types; top or bottom entering: 1 to 500 HP (B-102)
- ☐ Propeller types; top entering: ¼ to 3 HP (B-103)
- ☐ Portable: ⅛ to 3 HP (B-108)
- ☐ Side entering: 1 to 25 HP (B-104)
- ☐ Laboratory and small-batch production types (B-112)
- ☐ Condensed catalog showing all types (B-109)
- ☐ Quick-change rotary mechanical seals for pressure and vacuum mixing (B-111)
- ☐ Data sheet for figuring mixer requirements (B-107)

Check, clip, and mail with your name, title, company address to:

MIXING EQUIPMENT Co., Inc., 132-g Mt. Read Blvd., Rochester 11, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 10, Ont.

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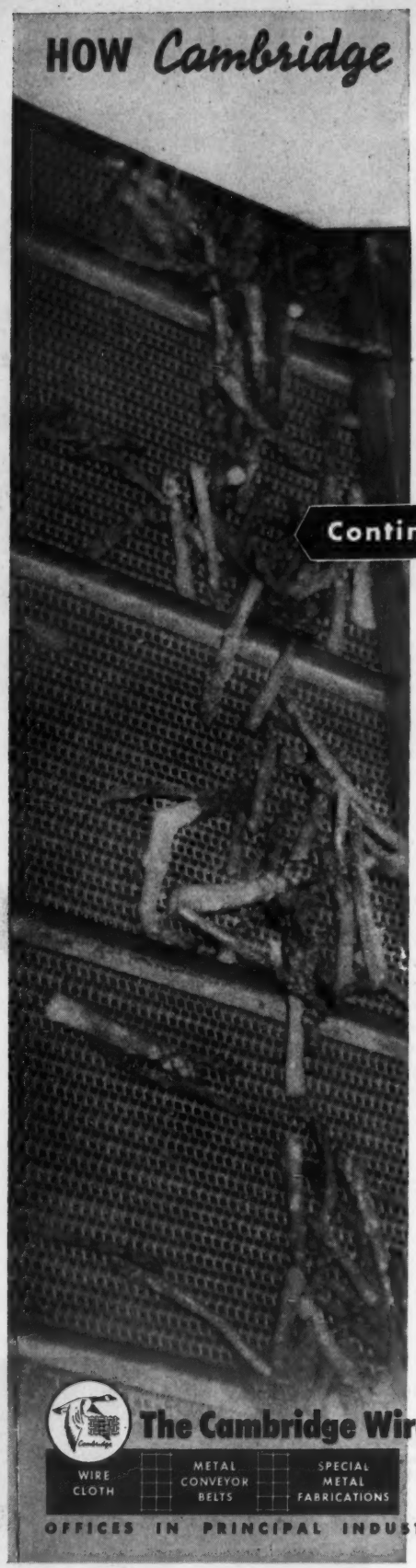

HOW *Cambridge* Wire Mesh Belts reduce food processing costs

By providing continuous movement through all phases of food processing, wire mesh conveyor belts minimize manual handling, enhance quality and uniformity, improve sanitation and reduce damage. Meat, poultry, candy, baked goods, fruit and produce can be frozen, canned, fresh-packed or baked faster and easier on moving belts. EXAMPLE:

Continuous Washing

MOVING BELT carries asparagus continuously from wash tank through a spray rinse on the way to the blancher.

SPECIAL CROSS FLIGHTS pick up stalks from surface of the wash water, hold them on the belt during inclined travel.

OPEN MESH permits rapid drainage of wash water, increases uniformity by providing free circulation of steam in blanching and of sub-zero air in freezing tunnel, allows small waste particles to fall through so they won't contaminate belt or product.

RUSTPROOF ALL-METAL BELT provides long life, is impervious to damage from process solutions, heat and cold . . . has no odor . . . will not contaminate product.

Cambridge Wire Mesh Conveyor Belts are made in any size, mesh or weave, from any metal or alloy, and can be used under a wide range of conditions . . . hot or cold, wet or dry. Call your Cambridge Field Engineer to discuss how you can cut food processing costs with continuous processing on woven wire conveyor belts. Look for his 'phone number under "Belting, Mechanical" in the Yellow Pages or write for FREE 130-PAGE REFERENCE MANUAL.

The Cambridge Wire Cloth Co.

Department H,
Cambridge 7,
Maryland

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

Radiation Preservation

(*Continued from page 27*)

still being attained step by step. But in any basic research program, knowledge comes the hard way — through successive and repetitious experiments. Frequently the commercial application, if there is one, stems from a side-effect or tangent that could never have been conceived without the original progenitor.

Radiation preservation of certain foods is, we believe, inevitable. What these foods will be and in what form they will be made commercially available, cannot be answered at this time. Suffice it to say that this new technique deserves a long, hard look by those in the food industry not presently engaged in this type of research.

Richard R. Wagner

DR. R. M. WAGNER
Director of Research

Makes photocopies up to 20" wide, any length

Uses: For copying large sketches, blueprints, etc., up to 20" wide by any length, and making letter-size copies.

Features: Makes about 60 to 90 sharp, error-free copies/hr. Makes 1-sided or 2-sided copies. Reproduces from all colors. Operates under all normal office and factory light conditions, including fluorescent and incandescent lighting. No shielding device required, no darkroom or extra equipment needed.

Description: Consists of an automatic continuous printer (6 x 9 x 30") with shutter-type light control, weighing 29 lb, and an automatic, continuous processor (6 x 7 x 30"), weighing 25 lb. Both stainless steel covered, and have heavy gage steel bases in gray hammertone.

(Genco EXACT-FAX DUO photocopy outfit is product of General Photo Products Co., Inc., Dept. FP, General Photo Bldg., Chatham, N.J. . . . or check 4965A opp. last page.)

Have you changed your address recently?

● If so, you'll want to insure that your copy of FOOD PROCESSING reaches you without interruption. Just send us your new address . . . use the convenient form below.

Please answer all questions in regard to your new affiliation, and in addition give us your former address including company, city and state.

mail this request to
READER SERVICE DEPT.
FOOD PROCESSING

111 East Delaware Place
Chicago 11, Illinois

Former Company Affiliation .....

Former Address .....

Your Name ..... Present Title .....

Present Company .....

Main Product .....

Rating of Company .....

Street Address .....

City ..... Zone No. ..... State .....

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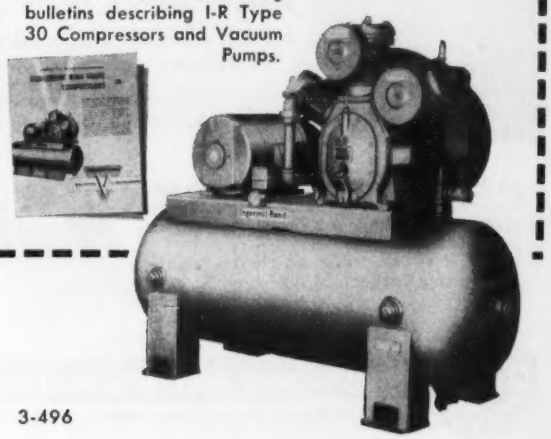

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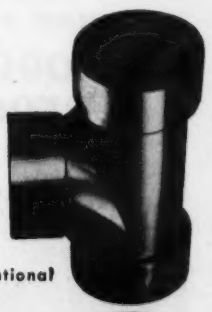
NEW PVC DRAINAGE FITTINGS for corrosive wastes



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- Unaffected by ground conditions or galvanic action.
- Joints stay tight permanently.

Write for Bulletin TTP-119 Tube Turns Plastics, Inc., Dept. FP-7, 2929 Magazine St., Louisville 11, Kentucky.

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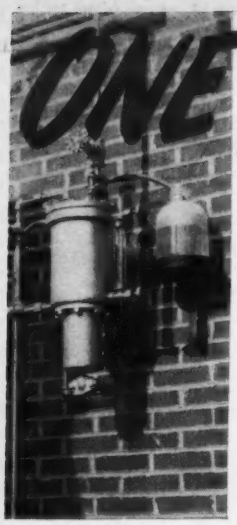

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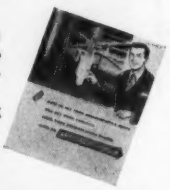

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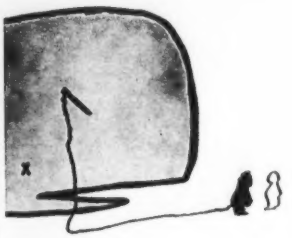
that's interesting



A whale of a toy

Seems to be no limit as to what can be done with plastics. New Jersey molder is turning out white whales for playground use. Plastic mammal, reinforced with glass fibers, is big enough so that kids can act out the story of Jonah. The curved tail provides a slide. Overall length 32'. They are made by Firmaline Products, Inc., Midland Park, N. J. (News Bureau — Bakelite Co. Div. of Union Carbide and Carbon Corp.)

"The Shrinking Hog"

The weight loss of hogs on way to market can be reduced by feeding them dark brown sugar in drinking water 48 hours before loading them for shipment. Sugar causes hogs to drink more water and craving for water continues for sometime after sugar intake has ceased.

Budget billion

If you have the time, here's one way of getting an idea of how much a billion really is. Just start counting, saying each number in full. You can count to a hundred in about a minute. If you keep going you will get up to a million after seven full days have gone by. And continuing, without a break, you reach a billion in slightly over 48 years. ("Through the Meshes"—W. S. Tyler Co., Cleveland, O.)

Aluminum Foil Packaging– Resistance to Insect Infestation

Report No. 10 of a Series by Reynolds Metals Company

Insect infestation of packaged foods and other products is important from the standpoint of health and sanitation as well as economics. And products, even though free of insects when packaged, may become infested by insects penetrating the package material itself.

Food manufacturers and processors are vitally concerned with the insect resistance of packaging materials. Consumers, too, have a stake in this—and so do wholesalers and market operators who can boost profits by purchasing in larger quantities. The risk is big, however, because of the difficulty and expense of insect control. Regardless of storage care, packaged foods pass through so many channels that contact with a wide variety of insects is inevitable.

The ability of insects to penetrate packages varies. It depends on the species of insect and its stage in life, the presence of folds, creases or scratches on the outside surface of the package, and particularly upon the type and thickness of the packaging material.

Among all materials, aluminum foil is outstanding in its ability to resist penetration by insects. This is in addition to its well known superiority in maintaining freshness and flavor by excluding moisture, air, odors and light.

Aluminum foil has several properties that make it an excellent insect barrier. It is hard, making it difficult for most species to bore through. It is odorless, tasteless and has no food value to attract insects. It is opaque and insects appear to prefer transparent materials. Since hunger or the desire for seclusion is the driving force that causes insects to bore through packaging materials, they are selective in their attacks. Most plastic and organic packaging materials absorb or allow the escape of food odors that insects can detect. In many instances, these materials themselves have characteristic odors or tastes that attract insects. Aluminum foil is non-absorptive and practically impermeable, making it an ideal component for insect-resistant packages.

Studies with various insects, particularly the cadelle and the lesser grain borer (both extremely good borers), have shown that they will penetrate 80% to 85% of packages made from widely used plastic films within two or three weeks' time. Proper use of 0.001" aluminum foil cuts this penetration to zero over a one month test period.

Greatest attention to this insect problem is being given to consumer packages—generally sealed overwraps, carton liners or pouches. But bulk storage of products for future use or processing presents an even greater problem. The solution is provided by the large variety of aluminum foil materials and packages available for bulk storage. These include multiwall bags with aluminum foil liners, case liners of aluminum foil, foil-lined fiber drums, and aluminum foil for lining storage bins. Use of aluminum foil for lining storage bins also permits effective fumigation to prevent reinfestation without contaminating the products stored.

The accompanying table gives the results of a controlled one-year test of insect infestation in a bulk storage situation.

Reynolds research facilities and experience are available to help solve your packaging problems. Call your nearest Reynolds representative. Or write **Reynolds Metals Company,** General Sales Office, Louisville 1, Ky.

EFFECTIVENESS OF ALUMINUM FOIL IN COMBATING INSECT INFESTATION

STORED PRODUCT
Tobacco, 1000-lb. lots

INFESTING INSECTS
Tobacco Beetle and Moth

DURATION OF TEST
One Year

CONTAINERS TESTED
Unlined Hogsheads and Hogsheads lined with laminated aluminum foil material (.0015" heat-sealing plastic film .001" aluminum foil 80-lb. paper)

RESULTS OF TEST

UNLINED HOGSHEADS
All were infested to a depth of 10 to 11 inches. Resulting tobacco loss was as high as 6%.

LINED HOGSHEADS
Infestation was confined to two small surface areas where lining material had been punctured. Penetration zero. Loss zero.

See "Circus Boy", Sundays, NBC-TV. Watch for Reynolds on "Disneyland", ABC-TV Network.

©Reynolds Metals Company, Louisville 1, Kentucky

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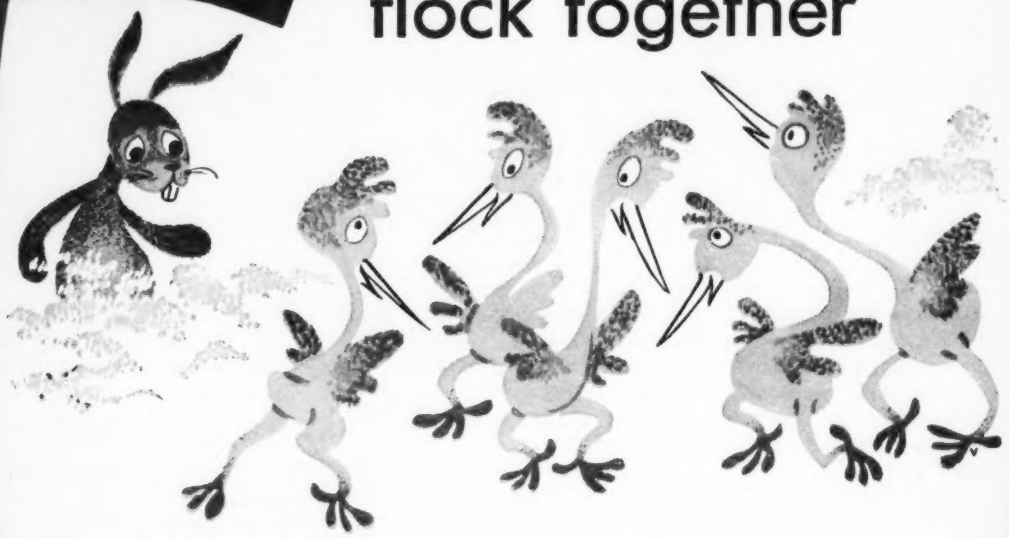
PROVERB PRATTLE

"Birds of a feather flock together"



The source of this goes back to the "Book of Wisdom" by Ben Sira written about 190 B.C. Numerous variations appear in "Promos and Cassandra" in 1578, in Shakespeare's "Henry VI" and others, including one elaborated comment in Secker's "Nonsuch Prof" of 1660: "We say that birds of a feather will flock together. To be too intimate with sinners is to intimate that we are sinners too."

• Quality begets quality and if you want high quality flavors that will survive long shelf life in dry mixes without weakening or deterioration, the answer is

"Sealva Flavors"

Top quality flavors, hermetically sealed in dry powdered form for all dry packed foods.

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